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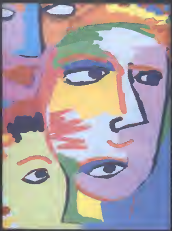

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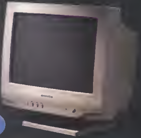

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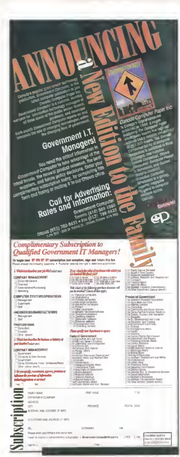
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FROM THE EDITOR

Bandwidth Blues

We were on a quest this month, the company's technical guys and myself. We wanted to find the best way to connect our company network to the Internet and to find a new home for our Web server. The thing that set this off was the decline and fall of our ISDN line. An ISDN line is a high-speed digital line from our office to our Internet service provider's (ISP's) office. We rent it from the phone company for about twice the cost of a regular business line. It is capable of delivering 128Kbps of bandwidth though it rarely achieves that rated speed. Even so, it is usually quite a bit faster than a regular modem line and worth the extra charges.

We have had an ISDN line for about two years now and in general it worked pretty well. The last three months though, have been hell—the kind of hell that sneaks up on you like those famous frogs in a hot water kettle. As the heat goes up they don't notice that they are getting cooked. One day we woke up and realized that we were getting cooked. The line went down so often that users in the office no longer believe assurances that the line would be back up shortly. We were waiting three days to get back online. For our information intensive office, it is the equivalent of having our phone lines cut. Everyone was getting irritable.

Connecting to the Internet in the best possible way is a huge challenge. Imagine, if you will, that the Internet consists of a giant Rube Goldberg contraption—a huge set of pipes that interconnect. Where you connect has all kinds of implications for how fast your connection will be. If you are lucky enough to connect close to the "big pipe" that goes out of town, your connections to other cities will be good. Often, with an ISP you are connected to a connection to someone else's connection, to the "big pipe" that goes out of town.

Really bizarre things happen with routing, even when you get a good connection out of town. The route will sometimes shock you. To get from our office in Vancouver, to our own Web site in Vancouver, we bounced through Seattle. Going across the country to one of our sites in Montreal resulted in a trip through Hartford, Connecticut and New York City.

Most ISPs are reselling their bandwidth. ISPs do this on the same principle as fitness clubs that sell thousands of memberships, when in reality they can only service a couple of hundred people at a time. They know that most people have good intentions to use the facility but often do not. It is common for ISPs to have line ratios of 10 to one; that is, 100 lines for 1 000 customers. Most of the time this works well. In peak periods, such as early evenings, users sometimes get some slow downs and busy signals. An important question to ask any ISP is "what is your bandwidth utilization?" Ask for charts and graphs. Ask the question a couple of times. Ask the salesperson, then ask the technical person. Differences in their responses are often revealing.

We often get requests from people asking "which is the best ISP?" or "who should I go to for the best connection for my Web server, or my ISDN line?" The answer to each of these queries is different. ISPs are set up with different emphasis, and as you will see in the following discussion, it is often very difficult to discern which will provide a good service. An ISP who provides great service for dial up customers might not be the best for a company looking to serve a Web site, or put an entire network of users online.

The factors that make up a great connection to the Internet and a good ISP are:

1) their connection to the Internet (i.e., where they plug in on the food chain)
2) their bandwidth utilization (i.e., how many times they have resold the same bandwidth)
3) and how good they are at keeping their connections alive and working (i.e., how many high-quality tech support people they have on for how many hours a day combined with how well they set it up in the first place and how overworked they are).

Not too slow

So, our quest began. We set out for a visit to our first ISP. It did not inspire confidence. This place could probably provide great service to a couple of thousand dial up customers but it did not seem like the best place for us. Their bandwidth utilization was claimed to be very low. We wondered at the veracity of this number given what we heard from other ISPs later. We were not confident that their tech support would be in place when we needed it. We moved on.

Another company we visited offered a more professional level of service to a much larger group, close to 10 000 dial up users. The whole set up was much more polished, but their bandwidth utilization was claimed to be much higher, estimated at 85 percent. We moved on.

Not too fast

One more stop was at a company that seemed to have all the high-end answers. These people were alumni of high-end networking companies, and had some brilliant ideas and solutions about redundancy, setting up guaranteed bandwidth and constant monitoring of their connections through the use of scripts and pinging and pagers. The problem with this company was that we received no follow up on our request for a quote.

Finally, we landed at a company that seemed to have the things we wanted. Good connectivity, good utilization and decent tech support. We balked when we got to their pricing. When we added it all up, we realized we could almost buy our own T1 connection (about six times the speed of an ISDN line) from the phone company for the amount that this company was asking.

Just right?

We were approached by people in our building who were planning to create a buying co-op for their own T3 line. They were proposing to bypass the telephone company altogether and rent some kind of laser beam contraption that shot a beam from our office directly to the downtown nexus of the Internet, a building about a half dozen blocks from ours.

One more possibility is to actually get our own T1, so that our bandwidth is guaranteed. This seems relatively plug and play once it is installed, but it does require more technical support on our end. This approach is also more expensive than others, but the bandwidth is all ours.

This is all so confusing. The differences in the options are enormous, and the consequences of selecting the wrong approach are significant. The jury is still out. We will keep you posted on where we end up.

Enjoy the issue.

Douglas Alder
Publisher

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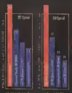

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Apple not dead, repeat, not dead

In declaring "Apple is dead" at the conclusion of his letter to the editor (April 1997) Jon Firth has joined those who take delight in declaring the end of Apple.

Normally, I don't spend my time responding to such obvious provocations as Mr. Firth's but in this case I feel compelled to respond. The financial markets and first buyer preferences are so volatile these days that at some point the declarations become self-fulfilling prophecies. Unfortunately, most of the heresy [illegible] of Apple is based on partial or biased information [illegible] old-fashioned ignorance [illegible] being spread concerning the [illegible] of Apple Computer. *The Computer Paper's* readership deserves better.

Here are the facts.

Macintosh is the Number 1 multimedia vendor in the world—for the second year in a row with 18.8 percent market share (*Multimedia Market Trends*, Dataquest, 1996).

Macintosh is the Number 1 platform for World Wide Web authoring, with 41 percent market share worldwide and 64 percent of U.S.-based professional Web site design firms (Mhat Consulting, published in *Macweek*, Oct. 16 1995; *Webweek*, Oct. 7 1996).

Apple is the Number 1 computer company worldwide in user loyalty with 87 percent of users repurchasing Macintosh computers (Computer Intelligence InfoCorp, June 18, 1996).

Apple is the Number 1 computer in K-12 education with 60 percent market share (Quality Education Data, *1996-97 Technology Purchasing Forecast*).

Apple is also the Number 1 computer in college and higher education institutions (Roper College Track, 1994; Computer Intelligence InfoCorp, 1994. More current statistics unavailable).

Apple is the Number 1 U.S. computer vendor in Japan and the Number 3 vendor overall in Japan (Dataquest, March 1996).

Apple is the Number 1 computer used for color desktop publishing, with 80 percent of the market share (Griffin Dix Research Associates, 1996).

There are roughly 14,000 applications for the Macintosh, nearly 3,000 in native PowerMac code.

Mac/Unix (the Mac OS) is the most popular platform for World Wide Web servers (Georgia Institute of Technology, [illegible] *Macweek*, Nov. 11 [illegible]).

Regardless of the platform designed for, 42 of the 50 top-selling CD-ROM titles worldwide were developed on Macintosh ([illegible]).

The Macintosh platform is used for [illegible] percent of postproduction video editing (*Film & Video*, 1995).

The Mac is used by 25.85 percent of all Internet users to access the Internet.

There are currently over 80 million Macintosh users worldwide.

More importantly, Computer Intelligence has recently reported (March 5, 1997) that the Mac OS actually took market share away from the X86 platform over the past year. While the Mac OS increased its market share by 4 percent, the X86 platform actually decreased by 5.1 percent. As a result, the Mac OS market share grew from eight percent in November 1996 to 11 percent in January 1997. As industry analyst Matt Sargent states, "The Macintosh platform is anything but dead."

Of course, much of this increase is the result of the emergence of Mac clones; however, the decision to license its OS was at the initiative of Apple, and is part of its long-term strategy to improve its market share position. Toward this end, Apple's efforts are obviously paying off.

In addition, Mr. Firth's comments regarding Apple's acquisition of NeXT and its current OS development are puzzling. He concludes, "Apple now has an unfinished and untested OS that history has shown will take at least a year and vast financial resources to develop."

What history is he referring to? Microsoft's and IBM's? A new release of the Mac OS is now shipping, and System 8.0 is due to ship this July. System 8.0, previously code-named Tempo, will incorporate much of the Copland technology Mr. Firth claims Apple has given up, such as a PowerPC native, multi-threaded Finder, significant interface changes and spring-loaded folders. Rhapsody, the NeXT generation OS, should begin to emerge late this year or early in 1998, and will run on all Macintosh computers currently available.

Finally, Apple's hardware development has never been stronger. As reported in *The Computer Paper* (April 1997), the PowerBook line is back on track with the release of the PowerBook 1400 and 3400. The latter containing a 240 MHz processor. As author Peter Milburn states, "It's by far the fastest portable on the planet."

Moreover, the QuickTake 200, Apple's new digital camera, can serve as a videoconferencing camera and presentation tool in addition to taking great pictures. Apple is also working with Exponential Technology on its next generation PowerPC processor.

The Exponential X704 is the world's fastest personal computer microprocessor running at a clock speed of 533 MHz—more than twice

Continued on page **10**

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Continued from page 8

that of any PC microprocessor currently available! Recently demonstrated on a Macintosh at the last Macworld Expo in San Francisco, it easily outperformed an Intel-based Compaq. Systems equipped with the new chip are expected to ship by the end of this year

In conclusion I have just one question for Mr Firth and the other Apple naysayers: Does this sound like a dead company?

Kevin Bushell Montreal

Revenge on the nerds

I read with great interest you article about Revenge on the nerds (Letter from the editor April 97) I too, am not convinced that technology is always the way to go Ironically my profession is to teach businesses how to use computer applications such as CorelDRAW In reality, I find some instances where it s better to use the trusty manual method

For example I bought an accounting package two years ago I tried to figure out the program myself and took a week to sift through the documentation (hard and soft) I then tried to customize the invoice program that came with the package That didn't work I got so frustrated that I sold the software through the classifieds. My accountant convinced me to give it another try, so I bought the updated version That version now sits on my shelf collecting dust

I see no faster way than writing invoices by hand as soon as the order comes in No need to boot up the computer start the software, feed the invoice through the dot matrix printer, and hope that it prints out OK In fact, personal handwriting is, in my opinion, in vogue as most business correspondence is computerized and lacks a personal touch

I could go on and on about personal organizers I use a $5 monthly school calendar—needs no batteries, and I can look at it in a glance No need to boot up the Yadda yadda

Technology is great When it works

Tom Anzai

More revenge

I am a high school student and just handed in a beautiful history paper before spring break This paper was worth one of the biggest marks for the term so a computer was a must So I went to work on my P166 and Corel Wordperfect Suite 7 while running on Windows 95 Writing the paper was the easiest thing I did—compared to printing it

At an office replacement sale we picked up a Xerox 4045-100 Series laser printer. This printer takes a while to warm up but once it does the image quality and speed are excellent However Xerox does not make a print driver for the 4045 in Windows 95 The print driver it does make is for Windows 3 x So what am I to do?

The convoluted solution is to run Windows 3 1 and another program, (because Corel requires Win95), to print something. Therefore in order to print my Wordperfect masterpiece, I have to:

A) Type it out in Corel. (Why? Because I'm spoiled and I really, really like all of the gadgets and doohickeys in WordPerfect)
B) Convert it to Microsoft Word format
C) Exit Win95 to DOS mode.
D) Start Windows 3 1.
E) Start Microsoft Word
F) Then print the copy

I could look past this convoluted path if I just had to print the paper once but things aren t perfect the first time and I hate proof reading off the computer. So I have to do this process several times a night I ve concluded that I spent just as much time printing the essay as proofreading it.

Now I ve looked for solutions. I ve tried different print drivers for the Win95 format and have emailed the companies involved (Corel Microsoft and Xerox) for a solution, but the only answer I received was from Corel telling me that they couldn t fix my problem (guessed as much) and that they were forwarding the problem to someone who could (I m assuming Xerox) As of yet, I have not received an answer and am not expecting one (I tried solving this problem last year)

Though I love my computer and all of it programs and quirks going through this process is not as funny at 4 o'clock in the morning when you find out—just after you've turned both your printer and computer off—that you ve missed a period in one of the footnotes Maybe I should go back to my 386 hmmmmmm.

Carl Tan, via Internet

World Wide Wait

Until flipping through Web pages is as fast as changing channels on a TV the Internet will remain highly overrated—busy signals, downloading times connection speeds, low-quality video and audio transmissions just to name a few And until these problems are rectified ,the Internet should be called by its true name: The World Wide Wait

Vince Mann, Calgary

More on litigation

While Douglas Gray provided a good general overview (SOHO column. "Avoiding common litigation mistakes" April 97), he did not mention an avenue for dispute resolution that is gaining increasing popularity The concept of alternative dispute resolution is not only gaining increasing acceptance within the legal profession, but in Ontario, mediation will soon be a required precursor to most cases before they can be heard in court Other provinces already have, or are planning, similar measures to ease the heavy burden on the courts system

Mediation and arbitration are often better suited to the early resolution of disputes involving small operations This process normally has a lower cost than litigation and, what is often very important is in complete privacy, since it can be shielded from the public exposure inherent in our open courts system. The rules governing the legal profession, at least in Ontario, require lawyers to advise their clients of the availability of this process.

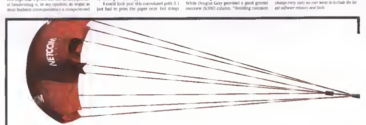
Walter Seaton, Toronto

They're not outdated, they re history

The article on architectural software on your Web site is inaccurate. Autodesk does not have the Home Series Architecture I spoke to them and they told me it has been long gone. The only software they have for architecture is the Kitchen not the whole house Please update this article.

Mariane van Durden via Internet

DA replies Note that the review originally appeared in The Computer Paper *(the newsprint version) in February 1995 It is not our practice to update stories in our online archives They are an archive of what was once true As you can well imagine it would greatly increase the amount of work of maintaining our Web site to go back and change every story we ever wrote to include the latest software releases and facts*



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WHAT'S NEW

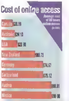
Canada Australia cheapest Internet countries • SYDNEY Australia (NB)—The cheapest places in the world to surf the Internet are Canada and Australia according to a report from the International Organization for Economic Cooperation and Development (OECD)

Excerpts from the report, *OECD Communications Outlook 1997* were be published in *The Australian Financial Review*

The study says 20 hours of online access to the Internet per month costs (based on U.S. currency) on average US$20.59 in Canada, US$24.13 in Australia and US$28.88 in the United States, which placed third. The amounts include telephone and access provider charges

The most expensive places to go cybersurfing include New Zealand (US$60.73 for 20 monthly hours) Germany (US$74.67) Switzerland (US$75.12) Austria (US$89.81) Mexico (US$90) and Ireland (US$91.57)

Nine of the worlds most costly areas for Internet access are in Europe mostly due to high European telephone charges according to the *Financial Review*



Affordable next-generation network scanner from H-P • One of the principal requirements of networked business enterprises is to use technology to make information accessible quickly, easily and reliably for everyone in the organization who needs it. One of the greatest challenges is to deal with information that exists on paper under forms correspondence, manuals, and other paper based archival material. One of the most popular solutions is to "digitalize" the mountains of paper so the information can be stored in and accessed from a computer database. To convert paper records into digital form, companies such as Fujitsu and Canon have over the years developed high speed scanners to scan dozens or hundreds of pages per minute and transmit the images to a networked database. In many cases, these workhorse network scanners cost in the $15,000 to $35,000 range

Hewlett-Packard (Canada) has now introduced the ScanJet 5, a 15 page per minute (ppm) 300 dot per inch (dpi) grayscale scanner which is manufactured in versions that support the main client-server networking technologies. ScanJet 5 models can connect directly to Ethernet 10Base-T, 10Base-2, Token Ring, 100Base-T and 100VG AnyLAN. They also support Windows NT Server 3.51 or 4.0, IBM LAN Server 3.0 or 4.0, and Novell Netware 3.1x /4.x. Depending on network connectivity options chosen the ScanJet 5 has a list price ranging from $4,201 to $4,481 —*JE*

Contact Hewlett-Packard, Tel 905 206-3772.

Stac launches ReachOut 7 • Stac, one of the two major players in the remote control market, has announced the release of ReachOut Version 7, which offers native 32-bit MS Windows NT 4.0 support and also features full Internet browser compatibility. The basic product contains versions compatible with five operating systems, Windows NT, Windows 95, Windows 3.1, DOS and 32 bit Web browsers

"From their own corporate Intranet or from anywhere in the world, ReachOut 7 users can use any TCP/IP network connection to remotely control their Windows desktops to run applications, send and receive email, edit spreadsheets and documents—all from within the familiar Netscape Navigator or Microsoft Internet Explorer browser interface," according to Stac chairman and chief executive officer Gary Clow.

With the new release Stac is setting a new standard for Internet integration and multi-operating system integration. ReachOut 7 has a list price of $195, and the ReachOut Global Internet access software, the browser related portion of the program, can be downloaded for free from the Stac Web site.—*JE*

Contact: Stac Tel 619-794-4300
Web site http://www.stac.com

Quarterdeck's releases Rapid Remote for Windows 95 • Released on Feb. 5 the brand new RapidRemote program from Marina Del Rey, Calif.-based Quarterdeck is labeled as "remote control for the rest of us."

RapidRemote features fast screen updates using advanced screen refresh technology to allow users to disable unnecessary screen operations such as screen savers and background wallpaper display. As well RapidRemote offers automatic color palette and resolution scaling technology designed to reduce the time required to refresh or update the screen image. Quarterdeck claims RapidRemote is extremely easy to use via a set of Smart Wizards that guide the user through the installation process, and a Connection Manager that makes placing a connection call a matter of clicking a mouse button

The street price for Rapid Remote is about $90. Coming into a market already dominated by established products such as Symantec's PCAnywhere and Stac's Reach Out, Quarterdeck will have its work cut out for it in finding a market share for RapidRemote. Working in its favor however is the fact that the remote control market is a growing one and there is undoubtedly room for a good new product in this highly competitive and fast changing software category.—*JE*

Contact: Quarterdeck Tel 310-309-3700
Web site http://www.qdeck.com

Dell puts MMX inside new Latitude LM notebooks • The LM M166ST is Dell Computer's latest Latitude Windows notebook. Based on an Intel 166 MHz MMX chip, the LM M166ST is Dell's fastest ever notebook. Dell also claims to have priced it aggressively to speed acceptance of MMX into the mainstream of mobile computing.

"In designing this new notebook system we focused on boosting ➤

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the Latitude LM's overall system performance, not just dropping in the latest processor," says Sharon Francia, Dell's director of marketing for portables.

In its base configuration, the LM M166ST comes with 16 MB of RAM, 1.4 GB hard drive, 10x CD-ROM drive, 12.1-inch SVGA TFT screen, lithium ion battery, MS Office Small Business Edition, Windows 95 and a one-year warranty. An upgrade to Windows NT 4.0 with Plug and Play and power management extensions for full notebook performance is available for about $150. Innovative performance enhancing technology built into the latest LM model includes a 128-bit video controller based on a single chip. The LM M166ST also features 256KB of Level-2 cache, PCI bus architecture, 64 000-color screen display, up to 72 MB of RAM expansion and MPEG 2 video playback support.

Canadian pricing was unavailable at press time, but with a suggested list of US$3 499, it should sell in the $4 900 range north of the border. Dell, which is the only major manufacturer to sell directly to end users rather than via retailers, is well known among power users for being an early adopter of leading-edge technology. —JE

Contact: Dell Tel: 800-289-3355
Web site: http://www.dell.com

Merger creates VR Didatech • Two Lower Mainland companies, Virtual Reality Systems and Didatech Software, have merged to form VR Didatech. The company will focus on educational multimedia and software.

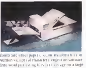
Virtual Reality Systems was best known for its educational software titles Canada Geograph and Adventure Canada. Didatech produced the educational software titles Crosscountry Canada, Crosscountry USA, Mathville and All the Right Type.

One of VR Didatech's current projects is Adventure Everest Online, a Web site that allows schools and students to track the progress of a joint U.S.-Canadian expedition to Mount Everest. Students can track the daily progress of the climb and interact via email with the expedition.

Contact: VR Didatech Tel: 800-665-0667
Web site: http://www.vrsystems.com

Microsoft Canada appoints BC regional manager • David Willis is Microsoft Canada's new regional manager for British Columbia. Willis, a native of B.C., previously worked for a Microsoft division in Toronto.

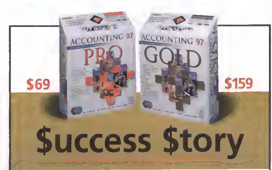
Fujitsu unveils new duplex scanner • Fujitsu Canada has released the Fujitsu M3093DE/DG, its next generation of high volume duplex (double-sided) scanners aimed at departmental and workgroup imaging applications. High speed scanners are typically used to digitize large numbers of forms and other paper documents, often for conversion via optical character recognition software into word processing files and storage on a large document database. Two versions of the new scanner are available: the DE (with a video interface and a suggested retail price of $7 395) and the DG (with a SCSI interface and a suggested price of $7 695). —JE



Contact: Fujitsu Tel: 800-263-8716
Web site: http://www.fujitsu.ca

Multimedia gurus to deliver keynote addresses at Multimedia 97 • John Warnock, founder of Adobe Systems Inc., will deliver a keynote speech on the opening day of Multimedia 97 in Toronto. Other speakers at the May 7-9 trade show include Willy Chiu, director of IBM's multimedia architecture, digital library and 3D VR technologies; Carlos Montalvo, head

continued on page 14



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16 mb EDO ram & 7ns pipeline cache
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S3 64V+ 2mb video & 33 6 PCtel vfx modem
Ms-Windows 95 cd ver installed & configured

P 133	$1208	or lease $45 /mth
P-166	$1400	or lease $52 /mth
P 200	$1712	or lease $63 /mth
Ppro 200	$2587	or lease $96 /mth

ULTINET TOWER PKG #TCP1

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 7ns 512 pipeline cache
1 6gb enh ide hdd & 15" Intelliview 28dp mtr
S3 64V+ 2mb video & 33 6 PCtel vfx modem
8x cdrom & Wave 32 sound with wavetable
Ms-Windows 95 cd ver installed & configured

P 133	$1726	or lease $64 /mth
P-166	$1918	or lease $71 /mth
P-200	$2230	or lease $82 /mth
Ppro-200	$2438	or lease $90 /mth

ULTINET TOWER PKG #TCP4

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
2 5gb enh ide hdd & 17" Intelliview 28dp mtr
S3 64V+ 2mb video & 33 6 PCTel vfx modem
8x cdrom & Wave 32 sound with wavetable
Ms-Windows 95 cd ver installed & configured

P-133	$2130	or lease $79 /mth
P 166	$2322	or lease $86 /mth
P 200	$2634	or lease $97 /mth
Ppro 200	$2842	or lease $105 /mth

ULTINET TOWER PKG #TCP15

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
4 1gb enh ide hdd & 17" Intelliview 28dp mtr
S3 Virge 2mb video & 33 6 USR fx modem
12x cdrom & Creative Labs SB16 sound card
Ms-Windows 95 cd ver installed & configured

P 133	$2475	or lease $92 /mth
P 166	$2668	or lease $99 /mth
P 200	$2979	or lease $110 /mth
Ppro-200	$3187	or lease $118 /mth

ULTINOTE/CD NOTEBOOK PKG #TCP7

Multimedia ntbk 11 3" dual scan 800x600 clr
16mb ram, 1 3gb hdd 256k cache & 1 44 flpy
8x cdrom 2mb video ram & 33.6 vfx modem
Three PCMCIA slots with two vacant
Approx 2hrs battery life carry case & ac adptr
Ms-Windows 95 cd ver installed & configured

P 133	$3050	or lease $113 /mth
P 166	$3242	or lease $120 /mth

ULTINET PERFORMANCE PRO PKG #2

Intel Pentium processor & Triton chipset
16 mb EDO ram & 7ns pipeline cache
1 6gb hdd & 15" mtr 8X cdrom & Wave 32
S3 64V+ 2mb video & 33.6 PCtel vfx modem
Ms Windows 95 cd ver installed & configured

P-133	$1509	or lease $56 /mth
P 166	$1761	or lease $65 /mth
P 200	$2073	or lease $77 /mth
Ppro 200	$2587	or lease $96 /mth

ULTINET TOWER PKG #TCP2

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
2.1gb enh ide hdd & 15" Intelliview .28dp mtr
S3 64V+ 2mb video & USRobotic 33 6fx mdm
8x cdrom & Creative Labs SB16 OEM sound
Ms-Windows 95 cd ver installed & configured

P 133	$1907	or lease $71 /mth
P 166	$2099	or lease $78 /mth
P 200	$2411	or lease $89 /mth
Ppro-200	$2619	or lease $97 /mth

ULTINET TOWER PKG #TCP5

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
3 1gb enh ide hdd & 17" Intelliview 28dp mtr
S3 Virge 2mb video & USR 33 6 fx modem
12x cdrom & Creative Labs SB16 OEM sound
Ms Windows 95 cd ver installed & configured

P 133	$2356	or lease $87 /mth
P 166	$2548	or lease $94 /mth
P 200	$2860	or lease $106 mth
Ppro 200	$3069	or lease $114 /mth

ULTINET TOWER PKG #TCP16

Intel Pentium processor & Triton HX chipset
64 mb EDO ram & 512k 7ns pipeline cache
4 1gb enh ide hdd & 17" Intelliview 28dp mtr
S3 Virge 2mb video & USR 33.6 fx modem
16x cdrom & Creative Labs SB16 sound card
Win NT Wrkstn V4 0 installed & configured

P 133	$2876	or lease $106 mth
P 166	$3068	or lease $114 /mth
P 200	$3380	or lease $125 mth
Ppro-200	$3589	or lease $133 /mth

ULTINOTE/CD NOTEBOOK PKG #TCP8

Multimedia ntbk, 12 1" active 800x600 tft clr
16mb ram 1 3gb hdd 256k cache & 1 44 flpy
8X cdrom 2mb video ram & 33 6 vfx modem
Two PCMCIA slots with one vacant
Approx 2hrs battery life carry case & ac adptr
Ms-Windows 95 cd ver installed & configured

P 133	$3859	or lease $143 mth
P-166	$4051	or lease $150 /mth

ULTINET SPECIAL EDITION #3

Intel Pentium processor & Triton chipset
16 mb EDO ram & 7ns pipeline cache
2 5gb hdd & 15" mtr 8X cdrom & Wave 32
S3 64V+ 2mb video & 33 6 PCtel vfx modem
Ms Windows 95 cd ver installed & configured

P 133	$1640	or lease $60 /mth
P 166	$1832	or lease $68 /mth
P 200	$2144	or lease $79 /mth
Ppro-200	$2587	or lease $96 /mth

ULTINET TOWER PKG #TCP3

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
3 1gb enh ide hdd & 15" Intelliview .28dp mtr
S3 Virge 2mb video & USR 33 6 fx modem
12x cdrom & Creative Labs SB16 OEM sound
Ms-Windows 95 cd ver installed & configured

P-133	$2027	or lease $75 /mth
P 166	$2219	or lease $82 /mth
P 200	$2531	or lease $94 /mth
Ppro-200	$2739	or lease $101 /mth

ULTINET TOWER PKG #TCP6

Intel Pentium processor & Triton HX chipset
32 mb EDO ram & 512k 7ns pipeline cache
SCSI (3 1gb hdd & 6X cdrom) Adptc 2940 ctrl
17" Intelliview .28dp mtr & SB16 Oem sound
S3 Virge 2mb video & USR 33 6 fx modem
Ms-Windows 95 cd ver installed & configured

P 133	$2983	or lease $110 /mth
P 166	$3175	or lease $117 /mth
P-200	$3487	or lease $129 mth
Ppro-200	$3695	or lease $137 /mth

ULTINET TOWER PKG #TCP17

Intel Pentium processor & Triton HX chipset
64 mb EDO ram & 512k 7ns pipeline cache
SCSI (4 5gb ultra wide hd, 12X cdrom) Adptc
2940UW ctrl 17" Intelliview .28dp mtr & SB16
S3 Virge 2mb video & USR 33 6 fx modem
Ms Windows 95 cd ver installed & configured

P 133	$4052	or lease $149 mth
P 166	$4244	or lease $157 mth
P-200	$4556	or lease $169/mth
Ppro-200	$4764	or lease $176 /mth

ULTINOTE/CD NOTEBOOK PKG #TCP11

No compromise big 13.3" 1024x768 active clr
32mb ram 2gb hdd & 256k cache 1 44mb
floppy & 6X enh ide cdrom, lithium ion battery
2mb video ram & 33 6 vfx modem, 2x Pcmcia
Approx 2hrs battery life & Ms Windows 95 cd

P-133	$5774	or lease $213 mth
P 166	$5968	or lease $220 mth
P 200	$6278	or lease $232 /mth

Upg S3 Virge 2mb to 4mb/Matrox Mystique 2mb/4mb (OEM)	$60/$145/$235
Upgrade S3 Virge 2mb to Matrox Millenium 4mb (OEM)	$395
Upgr ntbk 1.3gb hdd to 2gb, reg HX mbd to ASUS with 512k pipeline	$80
Upgrade reg cpu to P166/P200MMX cpu & ASUS HX mbd (the best)	$190/156
Upgrade SB16 OEM to SB32OEM, or SB64AWE	$175/$235
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Continued from page **12**

of Apple's interactive media products division and Intel's Ron Whittier, who helped create the first microprocessor in 1971.

The six year-old Multimedia 97 has grown to include over 400 exhibits, and 100 expert seminars and attracts more than 23,000 attendees to see the latest in multimedia technology. The event also includes the annual Digital Media Awards festival which recognizes world leaders in multimedia software and online services.—*JE*

Contact: Multimedia 97. Tel: 905 690 2491
Web site: http://www.multimedia.ca

IBM, Toshiba market leaders in Canada • IBM and Toshiba are leading the PC pack in Canada according to reports from two market research firms. A.C. Nielsen Canada, which worked with Toshiba of Canada's Information Systems Group (ISG), says Toshiba was the number one notebook computer manufacturer in 1996. Toshiba of Canada had 32.4 percent of the portable PC market, measured in units shipped, according to the research.

IDC Canada reported separately that IBM Canada was the top PC maker in Canada in 1996 with a 14.8 percent market share. IBM had 9.8 percent of the consumer market and 18.5 percent of the commercial desktop PC market last year.—*DT*

What's New is compiled by Jeff Evans, Keith Schengili-Roberts, Graeme Bennett, David Tanaka and Megan Johnston

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CIRCULATION Total National Circulation 387,000

BRITISH COLUMBIA EDITION	Vancouver	60,000
ALBERTA EDITIONS (Total 60,000)	Calgary	30,000
	Edmonton	30,000
PRAIRIE EDITION	Saskatoon, Regina, Winnipeg, Brandon	32,000
GREATER TORONTO EDITION	Greater Toronto	170,000*
EASTERN EDITIONS (Total 105,000)	Montreal	50,000
	Ottawa	30,000*
	Atlantic	25,000*

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Value performer.
$895.00[*]

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Network versatility.
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$1,995.00[*]

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Available April 15 - July 31, 1997
See printer carton for redemption coupon.

[†] Multi-function feeder holds 100 sheets or 30 envelopes, and comes standard on the 14ADV.

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[*] Manufacturer's recommended special price, reseller may sell for less. PrintPartner and Warranty Plus are trademarks of Fujitsu. MarkVision is a trademark of Lexmark International, Inc.

Triton II 3D Station

Intel Pentium Processor with Fan (support up to 200MHz)
Triton II 430VX PCI/ISA Main Board w/512KB Pipeline Cache
16MB 60ns EDO Performance-Enhanced DRAM exp. to 128MB
1.44MB Floppy Drive
1.7GB Fast IDE Hard Drive (Mode 4)
PCI Enhanced IDE Cont. w/ 2x16550 Serial, 1xBi-Directional Parallel
PCI ATI 3D Xpression + PC2TV 64-bit Accele[illegible] w 2MB SDRAM
Creative Labs Sound Blaster 32 Card with 60W Spe[illegible]
12x Speed EIDE CD-ROM
[illegible] 15" Non-Int. Low Rad. SVGA Monitor PnP
[illegible] Tower Case with CSA Power Supply
104-keys Windows 95 Keyboard, 3 Button Mouse
2 Year Parts & Service Warranty

EDO MEMORY

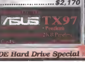
3D Games INCLUDED

Blaster PnP 32

100MHz	$1,550
120MHz	$1,560
133MHz	$1,600
150MHz	$1,640
166MHz	$1,790
200MHz	$2,090

New! Multimedia System with MMX Technology

166MHz w/ MMX Tech $1,905
200MHz w/ MMX Tech $2,170



Pentium Pro ATX

Intel Pentium Pro Processor with Fan
Intel [illegible] 440FX PCI ISA ATX Main Board
256KB Internal L2 Cache
32MB 60ns EDO Performance Enhanced DRAM exp. to 256MB
1.44MB Floppy Drive
2.1GB Fast IDE Hard Drive (Mode 4)
PCI EIDE Cont. w/2x16550 Serial, 1xBi-Directional Parallel
PCI Rev 2.1-5V interface compliant
PCI ATI Video Boost Windows Accelerator w/1MB (exp. to 2MB)
Sceptre 15" Non-int Low Rad. SVGA Monitor PnP
ATX Mid Tower Case with CSA Power Supply
104-keys Windows 95 Keyboard
3 Button MS Compatible Mouse
2 Year Parts & Service Warranty

180MHz $2,100
200MHz $2,200

Dual Pentium Pro System

Dual 200MHz ... C a l l

Free Installation

Pentium PCI MainBoard w/512KB Pipeline Cache

AMD

w/AMD K5 90MHz	w/AMD K5-133MHz
$188.00	$238.00

IDE Hard Drive Special

ENHANCED IDE

1.2GB	$250
1.7GB	$265
2.1GB	$305

2.5GB $318

HARD DRIVE

Free Installation!

Pentium Board w/512 KB Cache

w/IBM 6x86-166+	w/IBM 6x86-200+
$290.00	$425.00

Triton II Power Station

Features:
Intel Pentium Processor with Fan (support up to 200MHz)
Triton II 430VX chipset PCI/ISA Main Board w/512KB Pipeline Cache
8MB 60ns EDO Performance Enhanced DRAM exp. to 128MB
1.44MB Floppy Drive
1.7GB Fast IDE Hard Drive (Mode 4)
PCI Enhanced IDE Controller
PCI Cirrus Logic 5446 Windows Accelerator w/1MB DRAM(exp. to 2MB)
2x16550 UART Serial, 1 Bi-Directional Parallel
14" Non-Int SVGA Monitor .28mm dp
Mid Tower Case with 200W CSA Power Supply
104-keys Win95 Keyboard
3 Button MS Compatible Mouse
2 Year Parts & Service Warranty

64 Bit MPEG PLAYBACK

PENTIUM

100MHz	$ 975	150MHz	$1,065
120MHz	$ 985	166MHz	$1,215
133MHz	$1,025	200MHz	$1,515

Triton II Power Station Plus

Features:
Intel Pentium Processor with Fan (support up to 200MHz)
Triton II 430VX chipset PCI ISA Main Board w/512KB [illegible]
8MB 60ns [illegible] exp. to 128MB
1.44MB Floppy Drive
[illegible]GB Fast IDE Hard [illegible]
PCI Enhanced IDE Controller
PCI Trident 9685 3D Accelera[illegible]
2x16550 UART Serial, 1 Bi-Directional Parallel
14" Non-Int SVGA Monitor .28mm dp
Mid Tower Case with 230W CSA Power Supply
104-keys Win95 Keyboard
3 Button MS Compatible Mouse
Creative Labs Sound Blaster 16 Card
[illegible] Speed EIDE CD-ROM 60W Speakers
2 Year Parts & Service Warranty

SEGA Virtua Fighter Daytona [illegible] Virtua [illegible] Included!

PENTIUM

100MHz	$1,200	150MHz	$1,290
120MHz	$1,210	166MHz	$1,440
133MHz	$1,250	200MHz	$1,740

Internet Ready

Features:
AMD K5 PCI/ISA Main Board w/512KB Cache
16MB 60ns EDO DRAM exp. to 128MB
1.44MB Floppy Drive
[illegible]
PCI Enhanced IDE Controller
PCI Trident 9680 Windows Accelerator with 1MB DRAM(expandable to 2MB)
2 x 16550 Serial, 1 Parallel & 1 Game Port
14" Non-Int SVGA Monitor .28mm dp
Mini Tower Case with CSA Power Supply
104-keys Win95 Keyboard 3 Button Mouse
Creative Labs Sound Blaster 16 Card
[illegible] EIDE CD ROM, 60W Speakers
2 Year Parts & Service Warranty

AMD K-5

AMD K5-90MHz	$1,225
AMD K5-100MHz	$1,255
AMD K5-133MHz	$1,275

Video Graphics Adapters

ATI Mach 64 Video Boost PCI 1MB/2MB DRAM	$75/[illegible]
ATI Mach 64 WinTurbo PCI 2MB/4MB VRAM	$215/340
ATI 3D Xpression + PCI 2MB/4MB (w/3D Games)	$180/210
ATI 3D Xpression + PC2TV 2MB/4MB (w/3D Games)	$185/235
ATI 3D Pro Turbo PC2TV 4MB/8MB (w/3D Games)	$275/380
ATI TV Tuner Card	$145.00
Diamond Stealth 64 Video PCI 1MB/2MB DRAM	$80/100
Diamond Stealth 3D 3240XL PCI w/2MB VRAM	[illegible]
Diamond Stealth 3D 3400XL PCI w/4MB VRAM	$200.00
Diamond Stealth 3D 2000 PCI 2MB/4MB EDORAM	$120/180
Diamond Monster 3D w/4MB EDO RAM (Retail Box)	$310.00
Matrox Millennium PCI 2MB/4MB WRAM	$250/360
Matrox Mystique 3D Accelerator 2MB/4MB SGRAM	$180/235
Cirrus Logic 5446 PCI w/1MB exp. to 2MB (MPEG)	$50.00
S3 3D Virge PCI w/4MB EDORAM	$80.00
Trident 9685 3D Accelerators 1MB (w/3D Games)	$65.00

Monitors

ADI 4V/LR 15" NI/LR(1280x1024 .28mmDP)	$450.00
ADI 5V/LR 17" NI/LR(1280x1024 .28mmDP)	$775.00
Mag DJ530 15" NI(1280x1024 .28mmDP)	$475.00
Mag DJ700 17" NI(1280x1024 .26mmDP)	[illegible]
Mag DX700T 17" NI (1280x1024 .25mm Trinitron)	$850.00
NEC XV15+ 15" NI L/R(1280x1024 .28mmDP)	$545.00
NEC XV17+ 17" NI L/R(1280x1024 .28mmDP)	$1030.00
NEC M500 15" .25mmDP Mask Pitch	$540.00
NEC M700 17" .25mm DP Mask Pitch	$1110.00
NEC P750 17" NI,L/R(1600x1200 .25mmDP)	$1200.00
Proview 14" NI,L/R(1024x768 .28mmDP)	$258.00
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Sceptre 15" NI L/R 1280x1024 .28mmDP PnP	$555.00
Sony 100SX 15" NI L/R(1280x1024 .25mmDP) PnP	$565.00
Sony 100SF 15" NI L/R(1280x1024 .25mmDP) PnP	$645.00
Sony CPD-200SX 17" NI(1280x1024 .25mmDP)	$850.00
Sony CPD-200SF 17" NI(1600x1280 .25mmDP)	$1100.00
Viewsonic V775 17" NI(1600x1280 .27mmDP)	$890.00

HD/FD Controllers

ISA IDE HD/FD Controller with I/O UART 16550	$22.00
VLB Enhanced IDE with I/O UART 16550	$28.00
Adaptec 1505 SCSI CD-ROM Controller	$70.00
Adaptec 1542CP SCSI HD/FD Controller PnP	$275.00
Adaptec 2940U PCI Ultra SCSI Controller	$285.00
Adaptec 2940UW PCI Wide SCSI Controller	$330.00
Adaptec 3940W PCI Multi-Channel SCSI Controller	$530.00
Diamond FirePort 40 PCI Wide SCSI Controller	$250.00

Keyboards & Cases

Fujitsu 4725 Enhanced 104 Keys	[illegible]
Fujitsu 8725 Enhanced 104 Keys	$25.00
Lite-On Ergonomic Keyboard w/Touch Pad	$85.00
BTC Windows 95 Keyboard	$18.00
Microsoft Natural Keyboard	$78.00
28" Server Tower with 300W CSA Power Supply	$235.00
Full Size Tower with 230W CSA Power Supply	$105.00
Mid Size Tower with 230W CSA Power Supply	$87.00
Mini Size Tower with 200W CSA Power Supply	$47.00
Desktop with 200W CSA Power Supply	[illegible]

Drives & Tape Backup

1.2MB 5.25" 1.44MB 3.5" Floppy Drive	$37/30
Enhanced 1.2GB IDE Hard Drive	$250.00
Enhanced 1.6GB IDE Hard Drive	$265.00
Enhanced 2.1GB IDE Hard Drive	$305.00
Enhanced 2.5GB IDE Hard Drive	$318.00
Enhanced 3.1GB IDE Hard Drive	$399.00
Enhanced 5.1GB IDE Hard Drive	$585.00
Iomega 100MB Int/Parallel ZIP Drive	$215.00
Iomega 1GB Int/Ext JAZ Drive	$527/660
SyQuest EZFlyer 230 Ext Parallel/SCSI Remov. HDD	$410/470
SyQuest Syjet 1.5GB Int IDE/SCSI Remov. HDD	[illegible]
SyQuest Syjet 1.5GB Ext SCSI/Parallel Remov. HDD	$660/730
HP Colorado T1000 800MB Int/Ext Backup Drive	$185/220
HP Colorado T3000 TR Int. Backup Drive	[illegible]
HP Colorado T4000 TR-4 Int/Ext Backup Drive	$535/645
Seagate 800MB TR-1 Int/Ext Tape Backup Drive	$170/210
Seagate 3200MB TR-3 Int/Ext Tape Backup Drive	[illegible]
Seagate 8GB TR-4 Int. IDE/SCSI Tape Backup Drive	[illegible]

Motherboards

Triton II Pentium 120/150MHz w/256KB Burst Cache	$280/340
ASUS TX97 430TX Pentium Board w/512KB Cache	$ C a l l
[illegible] ATX Pentium Pro 200MHz PCI/ISA Main Board	$1000.00
Tyan Dual Pentium Pro 200MHz PCI/ISA Board	$ C a l l
486DX4-100/486DX5-133 PCI/ISA w/256KB Cache	[illegible]

MultiMedia

Creative Labs 12X Discovery AWE64	$305.00
Creative Labs Sound Blaster 16 PnP	$70.00
Creative Labs Sound Blaster 32 PnP	$100.00
Creative Labs Sound Blaster AWE64/AWE64 Gold	$200/380
Creative Labs 4211 Int. 4X2X SCSI CDR	$650.00
12X IDE CD-ROM Drive	$110.00
16X IDE CD-ROM Drive	$150.00
Panasonic 4x/2x Int. CD-R Drive w/SCSI cont.	$800.00
Pioneer 12X SCSI CD-ROM Drive	$225.00
Toshiba 15X 3801 SCSI CD-ROM Drive	[illegible]

Modem & Mice

14.4 S/R Int. Fax Modem w/Voice	$50.00
33.6 S/R Int. Fax Modem w/Voice	$83.00
Cardinal IDC100 ISDN Adapter	$262.00
Supra 33.6 Int. Fax Modem w/Voice	$122.00
US Robotics Courier I-Modem ISDN Int/Ext	$620/680
US Robotics Sportster ISDN 128K Int.	$320.00
US Robotics 33.6 Int Fax Modem	$136.00
US Robotics 33.6 Ext Fax Modem	$230.00
US Robotics 33.6V Int Modem(Full Duplex)	[illegible]
US Robotics 33.6V Ext Modem(Full Duplex)	$200.00
US Robotics 56K Int/Ext Fax Modem	$213/242
US Robotics Big Picture Video Kit	[illegible]
Microsoft Mouse v.2 OEM	$35.00
Logitech Mouseman OEM	$50.00
Microsoft Comp. Mouse	$10.00

Printers

Canon BJ-240 Color Inkjet	$220.00
Canon BJC-4100/4200 Color Inkjet	$308/320
Brother HL730/760DX Laser Printer 600dpi	$520/[illegible]
Epson Stylus 400 Color Inkjet 720dpi	$350.00
Epson Stylus 600/800 Color Inkjet 1440dpi	$420/620
HP 400 Deskjet Color Printer	$200.00
HP 682C Deskjet Color Printer	$405.00
HP 820Cxi Deskjet Color Printer	$640.00
HP 870Cxi Deskjet Color Printer	$600.00
HP 5/5N Laserjet 600 dpi 12 PPM	$1790/2170
HP 6L Laserjet 600 dpi 6 PPM	$550.00
HP 6P/6MP Laserjet 600 dpi 8 PPM	$1035/129[illegible]
HP 5Si Laserjet 600 dpi 24 PPM	$3030.00
Raven PR 2405 24 pin 192 cps	$235.00

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The Superior Engine for Windows Computing

AMD-K6™ MMX Processor

AMD-K6 MMX Processor w/64KB L1 cache
Triton II 430HX PCI/ISA Main Board w/512KB Pipeline Cache
16MB-60ns EDO Performance-Enhanced DRAM exp. to 128MB
1 44MB Floppy Drive
2 1GB Fast IDE Hard Drive (Mode 4)
PCI Enhanced IDE Cont. w/ 2x16550 Serial,1xBi-Directional Parallel
PCI S3 Virge 3D Accelerator Card w/4MB RAM
Creative Labs Sound Blaster 16 Card with 60W Speakers(P.M.P.O.)
16x Speed EIDE CD-ROM
Sceptre 15" Non Int. Low Rad. SVGA Monitor PnP
Mid-Tower Case with CSA Power Supply
104-keys Windows 95 Keyboard,3 Button Mouse
2 Year Parts & Service Warranty

AMD K6 MMX PROCESSOR

K6-166MMX	$1,835
K6-200MMX	CALL

Monthly Special !! Big Saving!!!

SIMM Memory

4MB 60ns 72-Pin EDO SIMM	$34.00
8MB 60ns 72-Pin EDO SIMM	$61.00
16MB 60ns 72-Pin EDO SIMM	$120.00
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Iomega

100MB Zip Cartridge

organize, move & Backup your Stuff

$16.99

ATI

3D Xpression with 2MB DRAM

Games Included !!

$130.00

Cirrus Logic

Cirrus Logic 5429 VLSA Bus Windows Accelerator w/1MB exp to 2MB

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[illegible]

33.6KBps Internal Voice Fax Modem

Limited Quantity !!

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[illegible]

"Flex Pro"-Truly amazing split Ergonomic Keyboard

$45.00

MICROCONCEPT NETWORK PRODUCTS FOR LESS !!

NOVELL SOFTWARE

Novell 3.12 5 user

$780.00

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NetWare v3.12 5/10 User	$780/1480
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NetWare v3.12 100/250 User	$4170/Call
NetWare v3.12 Manuals Only	$228

NetWare v.4.1*

NetWare v4.1 5/10 User	$765/1850
NetWare v4.1 25/50 User	$2255/$910
NetWare v4.1 100/250 User	$4175/Call
Netware v4.1 500/1000 User	Call/Call
NetWare v4.1 Manuals Only	$216

Upgrade Information

MICROSOFT NT

Windows NT Server v4.0 CD w/5 Clients Lic.	$1029
Windows NT Server v4.0 CD w/10 Clients Lic.	$1430
Windows NT v4.0 Extra Access Lic.	$45
Windows NT Server v4.0 upgrade w/5 Clients Lic.	$513
Windows NT Server v4.0 upgrade w/10 Clients Lic.	$685
Windows NT Workstation 4.0 CD	$355
Windows NT Workstation 4.0 upgrade	$188
BackOffice v2.5 Server CD	$2280
BackOffice v2.5 Server CD	$3150
Microsoft SMS version 1.2 w/10 Clients Lic.	$1425
Microsoft SMS version 1.2 w/25 Clients Lic.	$2360
Microsoft SNA Server v1.0 w/5 Clients Lic.	$1725

NETWORK PRINTER

HP 5N Laserjet,600dpi,12ppm 8MB	$2179
HP 5Si Laserjet,600dpi 24ppm,4MB	$3950
HP 5Si NX Netware Ready,600dpi,24ppm	$4300
HP 5Si Mopier	$10700
HP 4V Laserjet,600dpi,16ppm	$2800
HP 4MV Laserjet,600dpi 16ppm	$4000
Lexmark Optra Rn+ 16ppm 4MB	$2230
Lexmark Optra LXN+ 16ppm 8MB	$3300
Lexmark Optra LXN+ 16ppm 8MB Token Ring	$3960
Lexmark Optra N,24ppm 4MB	$3950
Lexmark Optra N,24ppm 16MB Token Ring	$5050
Lexmark Optra LX+ 16ppm,4MB	$2780
Lexmark Optra N,24ppm 16MB	$4750
Lexmark Optra C Pro 24ppm,38MB	$9000

TAPE [illegible]

Exabyte Eagle TR-3 Int. Backup Drive	$235
Exabyte Eagle TR-3 Int. Backup Drive w/Host	$288
Exabyte 8205XL 3.5-7GB Int/Ext 8mm DAT	$1925/2250
Exabyte 8505XL 7-14GB Int/Ext 8mm	$2850/3280
Exabyte 8700LT 5-10GB Ext 8mm Drive	$1430
Exabyte 8900XL 20-40GB Int/Ext 8mm Drive	$5320/6681
Iomega Ditto Easy 800 Int/Ext	$140/207
Iomega Ditto 2GB Int/Ext Tape Drive	$210/288
Iomega Ditto 3200 3.2GB Int/Ext	$287/358
Hewlett Packard SureStore CDR 6020 Int/Ext	$845/770
Seagate 4326NT 2GB 4mm DAT Int. SCSI Drive	$770
Seagate 4326NP 4GB 4mm DAT Int. SCSI Drive	$801
Seagate 4386NP 8GB 4mm DAT Int. SCSI Drive	$1145
Seagate M6000MR-SS 8GB Int. SCSI Scan	$815
Sony SDT-4000E Int/Ext 2-4GB DAT	$1065/1255
Sony SDT 5200 Int/Ext 4GB DAT	$1100/1280
Sony SDT 7000 Int/Ext 4-8GB DAT	$1380/1565

POWER PROTECTION

APC Back-UPS 280

$145.00

American Power 120 Volt

BackUPS 200/280	$128/148
BackUPS 400/450	$208/258
BackUPS 600/900/1000	$340/485/630
Backup Pro 280/420/650	$255/340/415
BackupPro 1000/1400	$545/750
SmartUPS 450/700/1000	$300/500/800
SmartUPS 1400/2200/3000	$855/1465/2220
Matrix 3000VA/5000VA (Modular UPS)	$3739/5600
SmartCELL for Matrix	$763
Line Conditioner LR600/LR1250	$170/245
PowerChute Plus for Netware v4.32	$64
PowerChute for Windows	$63
Network Surge Arrest 3 Outlet/7 Outlet	$20/$8
PowerManager 6 Outlet	$62
PowerNet SNMP agent for Novell	$137

CABLES & JACKS

Twisted Pair

Assembly 10 BaseT Cable 6/25/50 ft	$10/18/25
Assembly 10 BaseT Cable 100 ft	$45
Cable 10BaseT 8c UTP per ft	$0.35
Cable 10BaseT 8c UTP per 1000 ft	$220
Connector RJ45M	$1.00

Coaxial

Assembly RG58A/U Thin Coax 25/50 ft	$15/22
Assembly RG58A/U Thin Coax 100 ft	$36
Cable RG58A/U Bulk per ft	$0.25
[illegible]	[illegible]
Connector BNC "T"	$2.50
Terminator BNC 52 ohm	$1.50
Tool BNC Crimping	$59
Terminator BNC 52 ohm w/ground strap	$10

ETHERNET COAX / COMBO Adapters

3COM 3C503 Etherlink II BNC ea/5+	$275/240
3COM 3C509B Etherlink III BNC ea/5+	$150/135
3COM 3C509B Etherlink III BNC 20 pk	$2405
3COM 3C509B Combo BNC/RJ45 ea/5+	$180/165
3COM 3C509B Combo BNC/RJ45 20 pk	$2800
3COM 3C509B Combo BNC/RJ45 100 pk	$11000
3COM 3C562 Combo BNC/RJ45 EISA	$285
3COM 3C900 PCI Ethernet III Combo	$171
CNet CN200E+ BNC Ethernet Jumpless	$45
CNet CN600E BNC & 10BaseT Ethernet	$45
CNet CN800 PCI Ethernet Combo	$80
GVC 2000BT ISA Coaxial/10BaseT Jumpless	$55
GVC 2000BT PC Coaxial/10BaseT Jumpless	$55
Intel ISA EtherExpress Pro 10+ Combo	$155
Intel ISA EtherExpress Pro 10+/Flash Combo	$180
Intel PCI EtherExpress Pro 10+ Combo	$183
SMC 8416B ISA EtherEZ Coax	$120
SMC 8416BT ISA EtherEZ Combo	$145
SMC 8432BT PCI EtherPower Combo	$180

Print Servers

Emulex NetQueue 10BaseT Print Server	$445
Emulex NetJet NT + Print Server	$425
HP JetDirect J2550A RJ45	$443
HP JetDirect J2552A RJ45/BNC/LocalTalk	$555
HP JetDirect J2556A Token Ring DB-9 & RJ45	$730
HP JetDirect EX Plus J2591A	$400
HP JetDirect EX Plus3 J2593A RJ45/BNC	$623
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HP JetDirect J2590A 10/100VG Print Server	$703
Intel NetportExpress Pro Ext. Printer Server	$523
Intel NetportExpress Pro Int. Printer Server	$373
Intel NetportExpress Pro 3U Ext. Printer Server	$480

PCMCIA Adapters

3COM 3C589C Etherlink III TPO	$170
3COM 3C589C Etherlink III Combo	$243
3COM 3C489 Tokenlink III	$435
D-Link DE-660CT PCMCIA Combo NE2000 Compatible	$155
D-Link DME 2881 Ethernet/Modem	$410
GVC PCMCIA Ethernet Combo + 28.8bps Modem	$423
SMC 89201 EtherEZ PC Card (RJ45)	$170
SMC 89208T EtherEZ PC Card Combo	$232
Xircom PCMCIA Ethernet RJ45	$105
Xircom PCMCIA Ethernet BNC & RJ45	$225
Xircom PCMCIA RJ45 Ethernet + 33.6bps Modem	$425
Xircom PCMCIA Combo Ethernet + 33.6bps Modem	$455
Xircom PCMCIA Ethernet + 33.6bps Modem (Ultra-Slim)	$330
Xircom PCMCIA 10/100 Ethernet Ready	$230
Xircom [illegible] Ethernet Card	$260

10 BASE T HUBS

3COM 3C16441 SuperStack Entry Hub 12 Port	$305
3COM 3C16441 SuperStack II Entry Hub 24 Port	$803
3COM 3C16405 SuperStack II PSH Hub 40 12 Port	$665
3COM 3C16406 SuperStack II PSH Hub 40 24 Port	$1160
3COM 3C16670A SuperStack II Hub 10 12 Port	$555
3COM 3C16671A SuperStack II Hub 10 24 Port	$1225
3COM 3C16675B SuperStack II Hub 10 48 Port	$2850
3COM 3C16700 OfficeConnect 8/TPC	$135
3COM 3C16701 OfficeConnect 8/TPC	$255
3COM 3C16710 OfficeConnect 8/TPM	$111
CNet CN88TPC 8 Port Hub	$116
CNet CN89TPC 12 Port Hub	$235
CNet CN8816TPC 16 Port Hub Small Footprint	$258
CNet CN8800TPC 12 Port Hub	$535

CNet CN89101PC 12 Port Hub w/SNMP	$795
D-Link DE-808TC 8 Port Hub	$140
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Want to spice up your work in a hurry? Get clip art!

BY DAVID CHAO

What's the fastest, most effective way to spice up your newsletter, brochure, greeting card, or even a Web page? The solution is simpler and cheaper than you think It's spelled C-L-I-P A-R-T

At one time, newspaper and magazine publishers and graphic design houses bought generic illustrations on sheets of paper or in books When layout artists needed a picture they'd simply clip a suitable one out and paste it onto the layout Today, most layout is done on computers but clip art still exists not just in books but in digital form on CD ROMs and increasingly on the Internet

Hundreds of thousands of digital clip art images are available, so you shouldn't ever feel frustrated because you can't design your artwork from scratch And at a cost of about 10 cents per 100 images (that's one-tenth of a penny for each image!) clip art also makes a lot of economic sense Many companies are now including photos fonts and even sound or video clips in their packages. An increasingly common practice is for these same companies to post additional images on their Web site which customers can then download These often have a seasonal flavor valentines and Easter eggs in the spring, ghosts and goblins in the fall for example

In general, clip art images are royalty free In other words you don't have to pay a fee every time you use them for your publication (you should, however, read the fine print as there are some restrictions on using clip art commercially)

In this article we evaluate seven popular collections Keep in mind that, like everything else in the computer industry the quality style and prices of clip art packages vary widely Some packages such as those produced by Expert Software or Softkey are geared toward beginners or casual home users. They are inexpensive but tend to be simple in design

Others are targeted at commercial designers and boast superb quality more imaginative and contemporary designs, and yes, higher prices. Image Club's collections of clip art, for example cost many times more than the average product, but show a level of quality, polish and finesse that's high enough to please a professional

Following are seven popular collections (presented in no particular order)

Task Force clip art

From New Vision Technology

Price $50

At first thought, Ottawa-based New Vision Technology's collection of 10 000 clip art images appears tiny in comparison to the 110,000 or 150 000 images offered by other companies However, while Task Force may not win on sheer numbers alone It is worth considering if you want to keep life simple and only deal with one CD-ROM

And once you start using the Task Force collection, you'll quickly appreciate its high quality well-designed images and easy-to-use search-and-edit software Unlike some products, Task Force also comes with relatively sophisticated image editing software Once you select a specific image you can rotate it mirror it and even change its color without having to launch another application

Task Force

Another positive point is the artistic appeal and innovative designs apparent in the collection Instead of stuffing its CD-ROM with boring clip art New Vision Technologies chose to include attractive images that are decorative exciting, and even funky

If you're looking for a simple all-in-one package that isn't overwhelming or cumbersome to use, the Task Force collection could be the perfect companion for you. Business or high end graphic users, however may find this software too biased toward the "fun" side versus the "professional" side

Objectgear series

From Image Club Graphics

Price $135 each

Looking for the highest quality clip art for business or corporate use? Go for Image Club products, and you won't be disappointed At $135 each Image Club's Objectgear collection of 85 images seems expensive but this isn't your ordinary set of CD ROMs.

Designed primarily for professional graphics users, Objectgear boasts a high level of quality, with sharp details and true-to-life representation In fact, Image Club even supplies two versions of each image (high or low resolution), with pre-designed drop or cast shadows to give your presentation that extra "depth" look.

The photo-based Objectgear collection is available in six different themes: business antique, design, cultural, amusement and food. I evaluated the amusement and food CD-ROMs and absolutely loved them

The amusement collection includes nifty, quirky photos of delightful collectibles such as a water pistol paper weight, toy soldier and miniature car The food-oriented CD-ROM called the Clay Buffet was packed with unique images of food objects made out of clay In both cases, the images were crisp sharp, and simply fun to look at

I also checked out Image Club's Neo Techno and Hoopla Splash packages, each available for the same $135 price tag. Again these 125-to-200 image collections displayed above average quality and innovative designs The cartoonish looking, Generation X targeted Hoopla Splash was especially interesting and captivating

Image Club

Image Club a Calgary-based company that is now owned by Adobe Systems, offers many other types of clip art and photo images including Web site images background photos, contemporary art images, and even antique celestial maps For an average home user, however, the niche-oriented Image Club clip art may be on the expensive side and too limited in scope and magnitude In any case you may want to order the free catalogue by calling the company's toll-free number You'll have fun just browsing through the pages.

Contact: Image Club, Tel: 800-387-9193

Corel Mega Gallery

From Corel Corp

Price under $100

When it comes to giving users the most bang for their bucks, it's hard to beat Corel's Mega Gallery set of clip art CD-ROMs. Even though the five-CD-ROM collection costs less than $100 its photos, clip art, and video images boast surprisingly high levels of quality

Continued on page **22**

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Get clip art

Continued from page **20**

And because the Mega Gallery's images cover a wide range of categories themes and styles virtually any one can use them, regardless of whether they want to design a corporate newsletter or just spice up a letter to a friend

In fact with 60,000 photos 50,000 illustrations, 200 sounds and 100 short videos it's almost overwhelming This is especially true when you're trying to search for a specific object. The "wizard" tool does a good job of taking you through the search steps, but it can be time consuming to juggle five discs Although Corel throws in a multimedia file manager, it's a bit cumbersome to use

If you don't mind investing some time however you'll be rewarded with a wealth of excellent images suitable for many occasions Unlike some of the cheaper products described in this article Corel's images are well designed with good detail.

You might not find strange wacky or truly innovative designs in the Mega Gallery, but the strength of the Corel products can be described in two words. consistency and predictability Regardless of what you're looking for you'll always find something usable and interesting—no unpleasant surprises

For general use the Mega Gallery gets my nod as one of the best buys

Masterclips 150 000

From IMSI
Price $108

If you thought the Corel Mega Gallery was overwhelming with 110 000 images, wait til you try out IMSI's 150 000 Premium Image Collection Yes, that's 101 000 clip art images, 47 000 JPG photos 1 100 Web site images in GIF format, and 20 short run video clips IMSI even throws in 500 sound clips and 2 000 fonts. Included in the font collection are 300 that resemble handwriting (perfect for those form letters) The images are packed into a staggering 14 discs.

There is no doubt that with the largest selection of clip art available in this group of products Masterclips gets first prize in the lowest-price per image category A quick calculation reveals that you're only paying seven cents for 100 images with IMSI

This progressive company also bundles a simple-to-use browser and graphic editor, which makes it possible for you to manipulate the images and make numerous changes before pasting them into your favorite document.

Masterclips

I found it awkward however, to "search" for a specific clip art image using IMSI's built in software especially when you have to hunt through 14 different CD-ROMs Fortunately, IMSI does include a comprehensive black-and-white catalog of all images

Compared to high-end products, such as those offered by Image Club, the Masterclips collection trails behind in overall quality and originality and some of the images are less than mediocre. However overall it's still a well-executed package. Besides this is the only product to offer such a large number of photo images and the famous Dover Collection of Illustrations.

In general the images tend to be relatively simple and the quality is not consistent across the categories But when it comes to giving you the widest largest selection of images to choose from Masterclips is a hard act to follow No wonder it's one of the best selling clip art software packages

Click Art Image Pak

From Broderbund
Price $40 (25 000 images) $67 (65 000 images)

Broderbund a company well known for marketing the highly popular Print Shop series of home-oriented graphic software, offers a number of clip art packages under its Click Art brand name.

Available in two different packages, the Image Pak clip art collections are well suited to users who want to keep expenses down The 25,000 Image Pak only costs about $40, while the more extensive 65 000 Pak goes for a reasonable $67

Click Art

Both versions are ideal for beginners or casual graphic designers who don't need sophisticated detailed images but desire reasonably good quality clip art that covers a variety of topics themes and objects The Click Art Image Pak competes head to head with other mid-priced products such as New Vision Technology's Task Force which is similarly priced.

Although the Image Pak doesn't stand out as an innovative product it strikes a good middle ground between the this-is-too-much IMSI 150 000 collection and niche-marketed Image Club Both the three-disc 25 000 version and eight-disc 65 000 model offer good value overall but are bit on the conservative side when it comes to the design attributes

The flagship 65 000 Image Pak boasts 5 000 photos and 2 000 fonts while the less expensive one has 1,000 fonts but no photos A high-quality clip art catalog (color in the 65 000 Pak, black and white in the 25 000 Pak) and decent browser complete the packages.

Click Art also offers four other packages that are not commonly available Art Parts Bundle (woodblock engravings), www.art (300 Web images) Cartoons Fun Pak (500 single-frame cartoons), and Famous Magazine Cartoons (royalty free well-known cartoons)

Super Art Pack 33,000

From Softkey
Price $40

At this price the Softkey Super Art Pack is exactly the same price as Broderbund's Click Art 25 000, but offers more In total the Softkey clip art comes with 33 000 images including 2 500 photos, 1,200 sound clips and 2 000 fonts Like the IMSI product Softkey also throws in 300 handwriting fonts that can help make your letter look more personal and inviting.

Owned by The Learning Company, Softkey takes pride in offering value-oriented products at cut rate prices and the Super Art Pack is no exception

While this three-disc collection has enough clip art photos, and images to please most beginners and casual users keep in mind that the images are plain simple, and somewhat boring, at least for my taste If you're looking for clip art to use in business or professional publications you may find Softkey images to be too unsophisticated (the photos though were of higher quality than the clip art images)

Also I was disappointed that Softkey didn't include an indexed image catalog with the package You can, of course, examine the thumbnails of clip art through the browser that's included but it's sometimes easier to scan through a book

The Super Art Pack isn't a bad package when you take into account its low price but it doesn't stand out as one of the more attractive clip art collections

Continued on page **30**

Tips on using clipart

Somewhere between the Expert's $20 clipart and Image Club's $135 package lies a perfect product for you Here are some guidelines to keep in mind

Don't overuse clipart Two to four images per page should be plenty for most work.

Keep the theme consistent Try not to mix radically different design styles on the same page Think consistency

Vary the sizes of the images Shrink, expand or stretch clipart to give each one a different emphasis throughout your publication

Know your audience Use an appropriate design theme for specific demographics

Sometimes simple is better Don't assume that complicated detailed images are better Simplicity is more effective in some cases

And finally don't assume that larger packages automatically provide better value If you don't need 100 000 images it might make more sense to buy a 10 000 image collection that has everything crammed into one CD-ROM instead Some packages offer an astonishing number of images, but juggling with 10 or 14 discs to find that one perfect image can be time consuming and frustrating

Before making a decision, think about what you actually need versus what you think you want (most of us would not need sound clips, for example) —*David Chao*

Company Product	**New Vision Tech** **Task Force** **Clip Art**	**Broderbund** **Click Art 65000** **Image Pak**	**Broderbund** **Click Art 25000** **Image Pak**	**IMSI** **150 000 Premium** **Image Collection**	**Corel** **Mega Gallery**	**The Learning Co** **Softkey Super Art** **Pack 33 000**	**Expert Software** **3 500 Clip Art**	**Expert Software** **3D Clip Art**	**Image Club** **Objectgear**	**Image Club** **Hoopla! Splash**
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Type of Clip Art	General	General	General	General	General	Casual	Casual	Casual	High end	High end
Total number of images	10,000	65 000	25,000	150 000	110,000	33 000	3,500	500	85	125
Photos included	500	5 000	none	47 000	40,000	2,500	none	none	85	none
Fonts included	none	2 000 (includes 300 handwriting)	1,000	2000	1000	2 000 (includes 300 handwriting)	none	none	none	none
Sound clips	none	none	none	500	200	1 200	none	none	none	none
Video clips	none	none	none	20	100	none	none	none	none	none
Total number of discs	1	8	3	14	5	3	1	1	1	3
Indexed catalog included	Yes (color)	Yes (color)	Yes	Yes	Yes (color)	No	No	No	Yes (color)	Yes (color)
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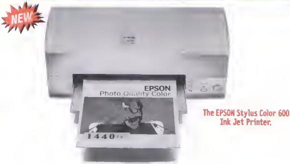

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- **-All** parts Menu and Software Drives
- **-Two year** labor and parts warranty

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ROCK PACKAGE 2

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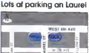

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In addition to the multi-disc, cover-every-topic clip art packages there also exists a niche of niche collections. Many of these are created by hobbyists and the art work is related to the creator's particular and occasionally peculiar interests. Because these images are often created by amateurs rather than graphic artists the quality varies widely. Few images are in color, most are black and white drawings.

A sample search on the words "clip art" in Alta Vista found more than 30 000 links. There is art online (some free and some that can be examined and ordered through the Web site) for almost every interest. Here are a few examples.

Celtic Collection • At the Highlander Graphics Software Web site you can view clip art packages including Celtic Collection Vol. 1 Version 2.0, a selection of borders elaborate Celtic knots images of dragons thistles, relics and kilt-clad dancers caber tossers and musicians. It is available for Mac and Windows, and according to Highlander is compatible with most every desktop publishing, graphics and word processing program. The collection is priced at US$24 95 (US$34 without a major credit card) plus about US$5 for shipping. Highlander also sells a Celtic font library and collections of holiday and wedding images.
Web site: http://www.underbridge.com/market/highland/

Fly fishing • One of the Web masters for this fly fishing and outdoors store in Glen Ellyn Ill. is artist Dave Whitlock who has posted his own black and white drawings of hand-tied flies and leaping fish on the store's Web site. He invites Web surfers and fishing enthusiasts to download the images for personal use.
Web site: http://www.flyfield.com/clip art.htm

•Brewing At the Brewery a Web site "dedicated to providing a comprehensive high quality collection of information about the art and science of brewing," you'll find free beer-related clip art. Included are label images to base your own labels on if you are a home brewer. The site creators note that "the older line-art drawings are from pre-1920s publications, so should therefore be copyright free." However they don't mention the status of the other images.
Web site: http://alpha.rollanet.org/

Gilbert and Sullivan • This archive of all things related to British comic opera creators Gilbert and Sullivan includes librettos, song scores audio files of songs and high resolution clipart drawings of scenes and characters from their famous works, such as *The Mikado* and *Pirates of Penzance*.
Web site: http://diamond.idbsu.edu/GaS/

Waste Prevention World • At this Web site you can download—for non-commercial use only—images of waste-prevention topics for the home or workplace. Including images promoting recycling composting and making better consumer choices. The site which is part of the California Integrated Waste Management Board also links you to other waste-prevention resources.
Web site: http://www.ciwmb.ca.gov/mrt/wpw/wpinfo/wpclipart.htm

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You don't need to be an industry insider to see that Microsoft products are gaining a foothold all over the PC software frontier Does the Redmond Wash giant envision a day when users will turn to a Microsoft product for every computer chore they undertake? You bet it does.

But though Microsoft is treading into all sorts of new territory one place it's been for quite some time is low-end desktop publishing (DTP) The Microsoft Publisher line has consistently rated at or near the head of the pack for a number of years and shows no sign of relinquishing that position

The latest version is titled appropriately enough Microsoft Publisher 97 and lives up to its proud heritage It leads the newcomer step-by step through the page layout jungle yet comes packed with enough advanced features to please all but serious high-end pros And it all takes place in the same clean clear Microsoft format that has made other Office suite components like Word so easy on the eyes and the cranium

MS Publisher like other page layout programs, serves as the final stop in the DTP process It is used to tie the pictures, words tables and other components of a publication (anything from a brochure to a banner to a Web page) into an aesthetically pleasing format for final production.

The program works on a frame based formula—that is, draw a frame then drop stuff into it. Merely decide what you want to place on the page pick the appropriate tool create the frame and you're on your way Maybe you'll insert a photo some text a piece of clip art or a table It doesn't matter because it all works on the same principle Later you can resize each frame to your liking by dragging one of its eight "handles" anywhere your heart desires

MS Publisher lets you import elements

Continued on page **33**

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Get clip art!

Continued from page 22

Expert Clip art (various titles)
From Expert Software Inc
Price $20 to $25 each

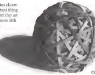
If your main focus is to purchase something simple for your children or for occasional use—and you want to keep the cost as low as possible—look no further than Florida based Expert Software These collections are cheaper than just about anything else on the market

The quality is average at best and the designs are too simple for my taste but Expert does offer 16 different types of clip art targeted at specific needs Some of the titles include Holiday Maps & Landmarks Religion Web Art and even 3D clip art The last one is worth pointing out as it contains 500 3D images that can be rotated in any direction

I also checked out the 3,500 clip art images CD-ROM, which is priced slightly higher at $25 The price may be attractive but with only 3 500 images to play with you're better off spending a bit more and buying one of the other competitive products

Some final thoughts
The variety of clip art collections makes choosing one package difficult One important thing to remember is that larger mega-sized clip art collections offer good value but are more difficult to use (because of the high number of CD-ROMs you have to sort out) Also I found that clip art packages with full-color index catalogs are easier to use since you can scan through the pages to look for ideas.

Have fun ❑



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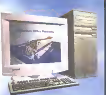

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Panasonic 12x CD-ROM	UltraDMA/33 IDE Interface	UltraDMA/33 IDE Interface	UltraDMA/33 IDE Interface
Creative Labs SoundBlaster 16	Panasonic 12x CD-ROM	Panasonic 12x CD-ROM	12xCD-ROM with Remote Control
Stereo Speakers 55W	SoundBlaster 16, 55W Speakers	SoundBlaster 16, 55W Speakers	SoundBlaster AWE64 & Speakers
Sceptre P531 15" Monitor	Samsung 15GLe, 15" Monitor	Samsung 15GLe, 15" Monitor	Samsung 15GLe, 15" Monitor
ATI Mach64 1MB Video Card	ATI Video Xpression + 2MB	ATI 3D Xpression + 4MB PC2TV	ATI 3D Xpression + 4MB PC2TV
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Microsoft Mouse, Floppy Drive	NMB Windows 95 Keyboard	Microsoft Mouse, Floppy Drive	Microsoft Mouse, Floppy Drive
Grolier's Encyclopedia	Microsoft Mouse, Floppy Drive	Intel LANDesk Client Manager	Corel WordPerfect Suite 97
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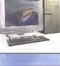

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Entry-level DTP

Continued from page **28**

from other programs in a variety of ways, including object linking and embedding (OLE) That means you can compose your literary masterpiece in a word processor, draw a pretty picture in CorelDraw, or enhance a scanned image in Photoshop, then haul it in for final positioning while still modifying the element in its original program Once the major elements have been placed, MS Publisher has a number of features to help you spruce up your final product

This year's version comes with more than 5 000 clip art images, 150 fonts 150 predesigned borders 100 design templates, a vector-drawing program called Microsoft Draw, and much more

The good news? Well, the clip art collection is pretty fair considering it's really just a bonus add-on, and so too are the fonts. The borders are definitely not high-end, but the program will create one for you by automatically shrinking and duplicating any image you choose an option not found in most other low-end packages.

The bad news is that despite suggestions to the contrary, MS Publisher still doesn't have what it takes to do high-end jobs all by itself For instance, although you can enter, format, kern and flow text from frame to frame throw in some fancy drop caps and work with columns and simple tables you'll have to do it with a less than thorough spell checker and no thesaurus. You'll also have to do it with the program s seemingly inherent sluggishness something that hasn t changed much through the years

The more artistic among you may want to twist, turn and rotate your text, and although MS Publisher allows you to do just that (and quite easily too usually with just a couple of mouse clicks), it'll have to be in pre-set increments and forms And if you've got a flair for drawing the vector based Draw component will handle only the simplest shapes and squiggles For anything beyond basic boxes, circles and lines, you'll have to turn to a standalone drawing package

One of the most damning aspects of the program in these days of multiple "undos" is that MS Publisher offers just a single level. So if you ve made a mistake more than one action ago, you re gonna be stuck with it. Unless of course, you want to go back to the last save but by doing that you'll lose anything you've done since then.

But let s get back to the positive elements, because there are so many MS Publisher is getting more graphical as the years go by and this edition offers both font and clip art previewing before you make your choice, automatic kerning of certain character pairs ("WA", for example), auto-hyphenation with customized zones, and automatic small capitals with a single click.

Those who forget to regularly save their work—and who among us can honestly say we don t—can opt to have the program prompt us automatically in custom-set intervals from one to 999 minutes This is but one of many features that make MS Publisher one of the "smartest" page layout programs around.

I first noticed this intelligence when randomly clicking the zoom in and out buttons (400 percent zooming is supported by the way) After a half-dozen clicks, I was presented with the following message "You can press the F9 key to quickly switch between your current zoom setting and 100 percent and to switch back and forth from 100 percent to your current zoom setting " Nice As I continued working, I discovered that a multitude of design and general tips were set to fly into action whenever the program determined my button-clicking rampages exposed certain, shall we say, weaknesses.

Of course what would an MS Publisher product be without PageWizards. These design aids help you decide just what it is you'd like to produce, then put the basic layout onto the page ready for you to plunk your picture or words into the spaces provided Advanced users will probably skip PageWizards entirely, but rookies will find them a welcome help

New to 97 are Specialty PageWizards, helping you set up varying styles of certificates, event tickets bookmarks and even Web sites. Actually, Web site design is something Microsoft has jumped into in a big way With MS Publisher 97, you can piece audio, video, hypertext links and just about anything else you can think of into a winning site without knowing hypertext markup language (HTML) coding then publish it to the Internet

Speaking of the Net, Microsoft has assembled a virtual treat just for MS Publisher users called Clip Gallery Live This is a collection of constantly updated clip art images accessible to anyone with a modem and Internet connection This, in essence, gives you a library of

Continued on page **35**

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Entry level DTP

Continued from page **33**

design elements limited only by how much stuff Microsoft puts on their site. I checked it out and was reasonably impressed with the quantity, even if the quality remains low to mid-grade.

The program is accompanied by a thorough manual (the Microsoft Publisher Companion), which features explanations of common and not-so-common tasks, definitions and visual representations of included fonts, and a picture of each and every piece of clip art on the CD. Unlike another Microsoft products of some note (can you say Windows?), Publisher owners are also offered free technical support for as long as they own the program.

Microsoft Publisher 97 is a sure thing for beginners and an inexpensive "final step" for all but DTP professionals.

Master Publisher

From International Microcomputer Software Inc.

System requirements:

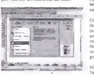
386 or higher (486 or Pentium recommended)

Windows 3.1 or above, 8 MB RAM, 5 MB hard-disk space (minimum), 25 MB for typical install, VGA video card

Street price: $70

If the truth be known, there's not much appreciable difference between one low-end DTP program and another. Sure, one may have a better grasp of a particular task or offer more tools than another, but most allow the non-professional to assemble attractive documents with a minimal learning curve and cash outlay.

Such is the case with IMSI's Master Publisher, which should handle just about everything most people will ever need to do. There are a few exceptions, of course, and since Microsoft Publisher would have to be considered the leader in its field, we'll compare. But first, let's check out the basics.



Master Publisher is actually a suite of three IMSI products: TurboPublisher, TurboDraw and Master Clips (a 20,000-piece subset of its massive 150,000 image clip art collection, which is sold separately). In concert, they make for a formidable offering with a surprisingly low price tag, giving any low-end DTP program a run for its money.

At the heart of the suite is TurboPublisher, a page-layout program in the "frame-based" mold of its Microsoft counterpart, except that here you'll draw a generic frame, then pick what will go in it. You won't find table building capabilities, or fancy first letters, and again there's just a single level of undo. Even worse, TurboPublisher has a curious way of flowing text between frames, asks you to "name" each frame, and features just a 200 percent zoom.

But you will find PowerText, a tool for manipulating artistic text such as headings or logos into all manner of shapes and styles, complete with backgrounds if desired. PowerText is similar to MS Publisher's WordArt, but with more versatility, and is an easy way to curve and mutate your words.

Master Publisher supports direct scanning, OLE, and various other importing tools, so there's really no limit to the type of stuff you can bring in. It's a program with a lot of amenities, including an audible auto-save reminder, but has a slightly "murkier" look than the Microsoft product and therefore is not quite as easy for the inexperienced user to grasp.

One of the more notable amenities is the Master Publisher's drawing component, TurboDraw, a wonderful vector based utility that is in essence a scaled-down version of full-blown drawing packages such as CorelDraw. Accessible from within TurboPublisher, there's not much you can't do with TurboDraw. It makes most other low-end DTP drawing programs pale in comparison.

Inevitable comparisons

And on that note, let's get to that inevitable Master Publisher/Microsoft Publisher 97 comparison test.

If Web pages are your bag, MS Publisher is the obvious choice for the simple fact that Master Publisher doesn't have the facilities to take you through the entire procedure. Although Master Publisher will let you design art for a Web page, MS Pub takes you from design to final implementation and certainly has all the bases covered.

On the other hand, if you have a penchant for using a lot of pre-designed images in your work, Master would have to be the way to go. With more than 20,000 clip art drawings and 1,000 photos, and most of them pretty decent at that, there's just no contest. Remember though, if you have a modem and Microsoft continues to increase the clip art numbers at their Web site, the pendulum could swing the other way.

For ease of use and rookie help, Microsoft wins for its ultra-clean interface that makes any other low-end DTP program look awkward. And although Master has its own tutorial equivalent, PagePilot, it just doesn't come across as fluidly as Microsoft's veteran PageWizard and its other assorted user-friendly aids.

Then there are the frills, the little extras that may not seem necessary at first but are so appreciated in the end. Master Publisher includes a screen capture utility that allows virtually any image on your screen to be used in your document, something lacking in Microsoft Publisher. Both programs offer "special character" keypad utilities, but Microsoft's is embedded within the program and is therefore easier to use. Finally, Master has a thesaurus and a font library utility that lets you group your typefaces according to your preferences, while Microsoft does not.

And there you have it. Some of the greatest recent strides in personal computing have come in the field of low-end DTP, almost enough to make that "low-end" tag seem inappropriate. As both of these products rank high in their field, either would make a solid addition to any hard drive. ❑

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Technology dazzles at Apple Music & Multimedia Show '97

BY KEITH SCHENGILI-ROBERTS

It wasn't long ago when all music was analog. That was before the advent of compact disc, MIDI and CD-ROM technologies. Now every instrument that can be plugged in is digital and music and software continue to merge. For a few days in March there is a human convergence too: techies get together with musicians at the Apple Music & Multimedia Show, an event that takes place at Toronto's Metro Convention Centre during Canadian Music Week.

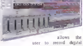
Actually, the techie side of things shouldn't be over-emphasized—the focus for this show is the music. Professional musicians and amateurs alike would be impressed by the array of exhibitors at the show. The Canadian firm Sabian was showing off its array of world-renowned cymbals, Fender displayed its electric guitars, and Boosey & Hawkes featured its trumpets and woodwinds. With demonstrations of the latest light show equipment and appearances by famous musicians like Patti Smith and Alice Cooper, it was clear from the outset that this wasn't your ordinary technical trade show.

There was still plenty of computer technology at the show and most of the high-tech booths brought in as much interest as those carrying high-end music equipment. Most of the city's major rock radio stations were there, but tellingly, one them (Q107) added a cyber café to its booth. People could come in, surf the Net, and listen to the station's tunes while sipping a non-alcoholic beverage.

Artists are increasingly aware that the Web can be a good promotional tool, offering cheap international exposure. There are so many Web sites catering to the music industry and bands that it almost seems like no band is legit these days unless they have a Web page.

Representing the Web biz at the trade show was www.hearandnow.com, a Web authoring company specializing in putting music and other entertainment-related items online. Artists are encouraged to add a short listing describing their band online for free. Bands with a little money can hire the company to create a professional Web site around the band, including the creation of sound files that users can download. If you are in a band and looking for some Web professionals to get a "Web presence," these people are worth checking out.

Steinberg had a booth at the show, demonstrating its well-known Cubase music production software. The latest, Cubase 3.0 for Windows 95 or Macintosh allows the user to record digital audio as if it were MIDI data. The program supports both WAV and AIFF sound file formats and works with most sound



Continued on page 39

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Telecom advances highlighted at InterComm 97

BY GEOF WHEELWRIGHT

For a few days in late February Vancouver was one of the most "connected" cities in the world. The occasion was a telecommunications industry trade show known as Intercomm 97 where the great and good of the world's telecoms industry gathered for a few days to offer their vision of a connected future and explain their role in that future

In a few keys areas the technology on display at the show stands to make a real difference in the way we work or communicate with one another over the telephone It may also expand the types of work that can be undertaken remotely with high-speed data connections

One such technology currently available in some Prairie provinces and undergoing trials in other Canadian markets is known as DSL (digital subscriber line) It promises Internet access speeds up to 250 times that of existing standard 28.8Kbps modems and even several times faster than most cable modem systems

Texas based DSL modem maker Paradyne for example showed off a range of very high-speed DSL models (up to 8 Mbps) that could download large AVI video clips over the Internet in a matter of seconds, bringing even the most complex graphics to the screen instantly

Then came the news that British Columbians could soon see DSL services being offered by BC Tel in the second half of this year According to Michael Kelly project manager of the ADSL (asymmetric digital subscriber line) effort at BC Tel over the past few months the company has been completing its technical trials and trying to figure out the best way to position and sell the service

"We are now going through the process of looking at the business model we follow," he says making it clear that they do not want to compete directly with Internet services providers (ISP's) as Sasktel has done with its Sympatico High Speed service "We want to work with ISPs We want to do this powerful product for people who work at home, who use video applications and so on Our big issue is building that business model We are all watching Sympatico in Saskatchewan. They are rolling out good numbers of customers getting positive feedback and we are interested in what they are doing."

In terms of the final specifications of the BC Tel system the company says it will depend on how it is finally implemented. "We are using one system [in trials] that offers 1 4 Mbps [about 50 times the speed of the average 28 8Kbps modem] downline and 64Kbps upline [about 2 5 two times the speed of a standard modem] and another that offers 7 Mbps downline We want to ensure a minimum of 1 54 Mbps to the customer."

Just how important the difference between upline and downline speeds is to you will depend a great deal on what you use your high-speed connection for If you are simply downloading Web pages and sending ordinary text-based email messages then it is only the downline speed that is likely to concern you.

On the other hand, if you want to use your ADSL line for video conferencing over the Internet or are in the habit of sending huge file attachments out with your email messages Then you will notice a big difference between an upline speed of 64Kbps and a downline speed of 1 4 Mbps Kelly suggests that these and other usage issues are likely to be the big determinants of whether those seeking high speed Internet access opt for ADSL or the more established integrated services digital network (ISDN) option

"We believe that ISDN has a particular application," he suggests For someone who is a high-speed Internet surfer then ISDN is good ISDN will be the consumer Internet access product [Because ADSL is not yet available] it is also the product that is here now has multiple applications is ubiquitous and well-distributed throughout service areas ADSL will probably be used for high-end Internet surfing"

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PCS arrives

There was also a lot of interest in the new personal communications services (PCS) digital mobile telephones and data communications services that have recently begun operation in many Canadian markets.

BC Tel Mobility for example showed off the new PCS telephones and data communications devices that can be used with its new digital network, which went into service in March. The company promised that users would enjoy a number of advanced features from the outset, including calling-line identification and a visual indication of when new messages have been left on their PCS voicemail service.

BC Tel Mobility is further promising that text messaging and email notification will also come soon to the new PCS system. The company is not, however, cutting off its existing cellular network from new PCS users.

Recognizing that users might not be satisfied with the limited coverage that the PCS network will provide in its initial stages (which has started with the Greater Vancouver area only) BC Tel Mobility is hoping that most customers will opt to use "dual-mode" PCS/cellular phones.

"The new digital phones are dual mode," says Ted Lattimore, vice-president of marketing for BC TEL Mobility. "So they automatically work on both our digital and regular cellular network."

He adds that when used in PCS mode the phones can offer better clarity—and performance. "Our advanced version of digital [phone] also functions at very low power so batteries last much longer. Users will enjoy up to five hours of talking time without recharging, or three full days of standby time," adds Lattimore.

Page me

During the show, BC Tel Mobility announced a new service for pager customers that lets them be contacted via the Internet.

From the company's Send a Page Web site (http://www.bctm.com/paging/pagsend.htm), it is possible to send either a phone number where you can be contacted (in the event you are sending a message to a numeric pager) or a text message (if the recipient has an alphanumeric pager). We tried it and a message took only 55 seconds from the time it left the keyboard of the PC to arrival at the pager.

Meanwhile, international wireless communications giant Glenayre Technologies (which was founded in Vancouver in 1963 and is now headquartered in Charlotte N.C.) announced efforts to establish a new universal paging standard.

Going by the rather unwieldy name of the GL3210 Glenayre Multiprotocol Paging Platform (GMPP) it is designed to be able to operate in both Europe and Japan with "roaming" features (so traveling users can be contacted even when they move from one country to another) and with text messaging in Japan. ❑

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Technology dazzles

*Continued from page **36***

card types, including SoundBlaster and Turtle Beach. Cut, copy or delete portions of your music in the Audio Editor, adjust the pitch of your songs, vary its speed, add effects and plenty more. If you are arranging MIDI files, you can visualize the data in a variety of forms, including a drum view dedicated to editing rhythmic work, displaying each drum sound by name, note and MIDI channel, or use the Score display to display the MIDI data as real notes. If you have Internet access, download the demo from the company's Web site.

If you want to create music with your PowerPC Mac, check out CyberSound Studio from Studio. Out of the box you get a keyboard, adapter cables and a CD-ROM. The CD contains CyberSynth and CyberPlayer software, which allows the user to lay down multi-track music in no time at all. They have plenty of different music voices to choose from, including 17 different drum sets and 223 instruments, ranging from the ear splitting wail of a Distorted Guitar to the concert-hall sound of a Grand Piano to "new" instruments like the "Moon Flute," "Doctor Bombay" and "Techno DrandDrums."

The program is a full-blown synthesizer and recording studio and editing facility and best of all, you are the studio owner. CyberSound Studio retails for US$99.

Apple had a sizable presence at the show and was displaying some high-end audio and CD-ROM mastering tools. Particularly impressive were the demonstrations by DigiDesign showing off the professional-quality audio software. Its Pro Tools III offers up to 48 disc tracks, up to 64 channels and a comprehensive internal digital mixing environment. For this you will need to dedicate a lot of Mac hardware, but if you are looking at setting up a professional digital recording studio, this is an option well worth investigating.

The Apple Music & Multimedia Show was a successful (not to mention entertaining) portion of Canadian Music Week. Expect the show to return to the same place at roughly the same time next year, bringing some digital, musical heat to a Toronto still otherwise in the winter blahs. ❑

Contacts:
Canadian Music Week, Tel: 416-695-9236.
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500CDS P120 / 16MB / 1.3GB / 12.1 DSTN ... $3000
510CDT P120 / 16MB / 2.1GB / 12.1 TFT 10X CD-Rom 28.8M ... $5000
660CDT P150 / 16MB / 1.3GB / 12.1 TFT 10X CD-Rom ... $5640
740CDT P166 MMX / 16MB 2.0GB / 13.3 TFT 10X CD-Rom 28.8M ... $8156

IBM

Think Pad 760ED
P133 MHz
2.1GB Hard Drive
12.1" Active Color Screen
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28.8 kbps Modem
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TP560 P133 / 8MB 1.08GB 12.1" TFT ... $5795
TP560 P133 / 16MB / 1.08GB / 12.1" ... $5000
TP760E P150 / 16MB / 2.1GB / 12.1" TFT ... $7246
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P/I-P55T2P4S 75-200MHz [illegible] ... [illegible]
[illegible] ... $198
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intel

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Titan-Pro (S1662) 150-200MHz Dual Pentium Pro ... [illegible]
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CPU/MEMORY

intel

Pentium Pro 180 / 200MHz ... $671 / [illegible]
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SCSI

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IBM

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[illegible] 3.2GB [illegible] ... $Call
[illegible] 2.1GB Ultra Wide SCSI [illegible] ... $575

WD AC21000 1.2G / AC21600 1.6G ... $260 / 259
WD AC31000 2.1G / AC32000 2.6G ... $299 / [illegible]
WD AC31000 3.1G / AC33000 4.0G ... $536 [illegible]
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WD S2170-0007 2.1GB UW SCSI 8ms 7200rpm ... $870
WD S4160-0003 4.3GB SCSI 8ms 7200rpm ... $1236
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Jaz Drive 1GB SCSI Int./Ext (12ms 6.6MB/sec) ... $400 / 420
Jaz Disks 1GB Single Cartridge / 5 Pack ... $125 / 615

YAMAHA

Yamaha CDE-400 6Rx4W CD-Recorder Int./Ext. ... [illegible] / 858

CREATIVE

Creative BlasterCDR-4210 Recorder 4R/2W 6X ... $615

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SureStore CD-Writer 6020i 6R/2W Int. (incl Software) ... $630
SureStore CD-Writer 6020es 6R/2W SCSI Ext. (incl Software) ... $770

Memorex Sony CD-Writer Media Single ... $11 13

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CONNER

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Jumbo 1000 1.4GB Int. ... $178
T4000S 4-8GB Travan Int (DC3000) ... $625
TAPE 3M TR-1 400MB / MC3000XL ... $30 / 30
TAPE 3M TR-3 1.6GB / TR-4 4.0GB ... $40 / [illegible]

Seagate

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STT8000N 4-8GB (DC3000) [illegible] Ext. w/tape ... [illegible]

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Ditto 2.0GB 3.2GB Int. Ext. ... $293 / 375

VIDEO CARD

ATI

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3D XPression + 2MB Ext. 4MB w/o TV output ... $148
3D Pro Turbo 4MB EDRAM 4MB ... [illegible] / [illegible]
TV Tuner ... $145

DIAMOND

Stealth 64 3D 2000 4MB Exp. 4MB (OEM) ... $100
Stealth 64 3D 3400XL 4MB VRAM (OEM) ... $279
Monster 3D 4MB [illegible] RAM (Add-on Card) Retail ... $306

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Mystique PCI 3D 2MB + 2MB RAM / 4MB + SDRAM ... $130 / 218
Millennium MIL / 2B / MIL / 3 PCI 2MB WRAM ... $[illegible] / 236
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MOTOROLA

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XIRCOM

PCMCIA CEM-3001 modem Lan Combo ... $348

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U.S.Robotics

Sportster Voice 33.6 V.34 w/Fax/Voice Int. (OEM) ... $130
Sportster 33.6 X2 Fax Modem Int./Ext (Retail) ... $[illegible] / 205
BigPicture Video Kit (Camera, Modem, Capture) ... $612
BigPicture Video Modem & Capture Board ... [illegible]
Sportster ISDN 128k Terminal Adapter Int. ... $345
Courier ISDN 128k Int. / Ext. ... $415 / [illegible]
3Com 3C[illegible] Compact IQ 128K Modem ... $470

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brother

Laser Jet HL730DX 600dpi 6ppm (+ [illegible] Rebate) ... [illegible]
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Canon

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Stylus 1000 Color ... $409 / Call

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LaserJet 6P 600dpi 8ppm 2MB ... [illegible]
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LaserJet 5M 600dpi 12ppm 8MB w/PS ... $2 409

MONITOR

AOI

MicroScan 4V 15" .28mm NI LR ... $443
MicroScan 5V 17" .28mm NI LR ... $700

SAMSUNG

GM1795 17" [illegible] 17" .25mm 1280x1024 ... [illegible] / 945

SONY

Multiscan 100SX 15" / 100 W 15" .25mm ... $390 / 638
Multiscan CPD-200SX 17" CPD-200SF 17" .25mm ... $830 / 1995
Multiscan CPD-300SFT 20" 1600 x 1200 .30dp ... $2595

MITSUBISHI ELECTRONICS

Diamond Scan 15HX 15" .28mm ... $560
Diamond Pro 17" 87TXM .25mm ... $1140
Diamond Pro 21" 91TXM .30mm ... $2155

VIEWSONIC

Optiquest V775 17" 1600x1280 / V773 17" 1280x1024 ... $[illegible] / 865
ViewSonic 17GS 17" .27mm 17PS 17" .25mm ... $799 / 879
ViewSonic G771 17" .26mm PT775 17" .26mm ... [illegible] 1145
ViewSonic [illegible] 20" .26mm G810 21" .26mm ... $1590 / 1000
[illegible] PC Magazine Editors' Choice
Nanao FlexScan 17" TX-C7S 1600x1200 .25mm ... $1000

NEC

NEC C500 15" / M500 15" .25mm (New) ... $[illegible] / 575
NEC M700 17" .25mm (New) ... [illegible]
NEC [illegible] .25mm ... [illegible]

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Bose Lansing ACS55 PowerCube w/Dolby 3-Sound ... $248
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Multimedia JT150A 160W Speakers ... $40

CREATIVE

SoundBlaster 16 PnP w/o IDE / w/ IDE ... $62 / 70
Sound Blaster 32 PnP (OEM) ... $136
SoundBlaster AWE64 PnP (Retail) / Gold (Retail) ... $245 / 323
SoundBlaster [illegible] ... $385

CD ROM

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Toshiba XM6002B 12X EIDE Int. ... $149
Hitachi CDR 7930 8X CD-ROM ... $108
Hitachi CDR 8130 16X CD-ROM ... $170
Toshiba XM5701B 12X CD-ROM SCSI Int. ... $230
Pioneer DR406 SCSI 12X Int. ... $236

NETWORKING

CNet

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CNET PCMCIA [illegible] Ext. Combo ... $72
CNET CN801TPC 8 Port Hub ... $175
CNET CN8016TPC 16 Port Hub ... $310
CNET CN8020TPC 20 Port Hub ... $300

3Com

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EtherLink 10BB 3C509B Combo Single ... $156
EtherLink PCI 3C900 TP (RG45) Single ... $50
EtherLink PCI 3C900 10BT & 10B2 Combo Single ... $[illegible]
Fast EtherLink PCI 3C905TX 10/100BT ... $100
LinkBuilder FMS-II 3C16670 12 Port Hub ... $758
LinkBuilder FMS-II 3C16671 24 Port Hub ... $1,382

intel

EtherExpress Pro 10+ ISA Combo 10BT ... $130
EtherExpress Pro 10+ PCI 10BT ... $130
EtherExpress Pro PCI 10/100 PCI 10BT/Combo ... $185
EtherExpress Pro PCI 10/100 PCI 5Pack 10BT ... [illegible]

CONTROLLER

adaptec

SCSI ISA Adaptec 1505 OEM ... [illegible]
SCSI ISA Adaptec 1522A OEM ... [illegible]
SCSI PCI Adaptec 2940U (OEM) ... [illegible]
SCSI PCI Adaptec 2940 UW 6X OEM ... $330
SCSI SlimSCSI 1460 PCMCIA to Fast SCSI-2 ... $230

DIAMOND

Diamond FirePort 40 Ultra SCSI (U Wide Inc.) ... $255

SOFTWARE

Corel Draw V7.0 for Windows 95 CD ... [illegible]
Corel Office Pro / Up ... [illegible] / 139
Corel Print House 1.5 ... $46
Corel Gallery V2.0 ... [illegible]
Corel photo paint ... [illegible]
McAfee Virus Scan for Win95 ... $75
Norton Anti-Virus for Win95 ... $104
Norton Utilities for win(9) ... $172
Symantec WinFax Pro Ver 7.0 Full ... $[illegible]

Microsoft

MS NT Server Ver.4.0 5 Users, OEM, Up ... $1015 / 2078
MS NT Workstation Ver.4.0 (OEM)/Up ... $283 / $195
MS Home Essential (MS Word, Bookshelf, Money & Works ... $115
MS Office 97 STD / Up New ... [illegible] / 300
MS Office 97 PRO / Up New ... $170 / [illegible]
MS Office 97 PRO (OEM) (Bound only) ... $430
MS Windows 95 2-CD (Bound only) ... $120
MS Publisher 97 ... [illegible]

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- **-PCI 64bit 2MB MPEG Card**
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- 1.44MB 3.5" FDD
- -104 (Windows 95) Keyboard
- -Mid-size Tower Case
- **-Logitech Mouse + Pad**
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- **-SoundBlaster 16 PnP**
- -60W Amp Stereo Speakers
- -Compton's Encyclopedia & 4 CD Titles

P-133MHz **1438** P-150A +$60 $47/mth*

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Upgrade Options		Software Options	
Up to 512K PB Cache	+$20	Windows 95 (Release 2)	$130
32MB RAM (from 16M)	+$110	Windows NT (Station)	$280
2.1G HD (from 1.7G)	+$50	Corel WordPerfect Suite	$90
Acer 33.6 V/F/FD/Modem	$130	MS Office 97 Pro	$480

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- **-512K Pipeline Cache**
- **-16MB EDO RAM** (up to 128MB)
- **-2.1GB E-IDE HDD** (Mode 4)
- **-ATI 64 2MB MPEG Card**
- **-15" N-I L-R SVGA Monitor**
- 1.44MB 3.5" FDD
- -104 (Windows 95) Keyboard
- -Mid size Tower Case
- **-Logitech Mouse + Pad**
- **-EIDE 12x CD-ROM**
- **-SoundBlaster 16 PnP**
- -60W Amp Stereo Speakers
- Compton's Encyclopedia & 4 CD Titles

MMX-166 **1828** $59/mth*

MMX-200 **2038** $66/mth*

Upgrade Options		Software Options*	
32MB RAM (from 16M)	+$110	Windows 95 (Release 2)	$130
2.5G HD (from 2.1G)	+$40	Windows NT (Station)	$280
18x CD-ROM (from 12x)	+$40	Corel WordPerfect Suite	$90
Acer 33.6 V/F/FD/Modem	$130	MS Office 97 Pro	$480

Pentium Pro 180/200

- **-Pentium Pro 180/200MHz w/ 256K Cache**
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- **-2.1GB E-IDE HDD** (Mode 4)
- **-ATI 64 2MB MPEG Card**
- **-15" N-I L-R SVGA Monitor**
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- 1.44MB 3.5" FDD
- 104 (Windows 95) Keyboard
- **-Logitech Mouse + Pad**
- **-EIDE 12X CD-ROM**
- **-Soundblaster 16 PnP**
- -60W Amp Stereo Speakers

Pro-180 **2298** $74/mth*

Pro-200 **2498** $80/mth*

Upgrade Options		Software Options	
64MB RAM (from 32M)	+$220	Windows 95 (Release 2)	$130
2.6G HD (from 2.1G)	+$46	Windows NT (Station)	$280
18x CD-ROM (from 12x)	+$40	Corel WordPerfect Suite	$90
USR 33.6 Full Duplex VI	$176	MS Office 97 Pro	$480

6x86 P150+/P200+

- **-Cyrix 6x86 P150+/P166+ CPU**
- **-MMX Ready/256K Pipeline Cache**
- **-16MB RAM** (up to 128MB)
- **-1.3GB E-IDE HDD** (Mode 4)
- **-PCI 64bit 1MB MPEG Card**
- **-14" N-I L-R SVGA Monitor**
- 1.44MB 3.5" FDD
- 104 (Windows 95) Keyboard
- Mid-size Tower Case
- -MS-Comp. Mouse + Pad
- **-Panasonic 8x CD-ROM**
- **-Acer 16bit Sound Card**
- -60W Amp Stereo Speakers

P150+ **1238** P166+A +$50 $40/mth*

P200+ **1388** $45/mth*

Notebook: Hitachi, IBM, NEC, Toshiba

Lease Available

HITACHI

E133DN	P133	16M	1.0G	11.3DSTN				$2098
E133T	P133	16M	1.0G	11.3TFT				$2728
M100D	P100	8M	810M	11.3DSTN	4X	28.8	10BT	$2498
M120D	***P120***	***16M***	***1.0G***	***11.8DSTN***	***8X***	***28.8***	***10BT***	***$2498***
MX133T	P133	16M	1.4G	11.3TFT	6X	33.6	10BT	$4898

TOSHIBA-SatellitePro

430CDS	P120	16M	1.3G	11.8DSTN	10X	$2778
430CDT	P120	16M	1.3G	11.8TFT	10X	$3698

SCEPTRE-Soundx

3800	P100	8M	1.0G	11.3DSTN		$1988
3900	***P100***	***16M***	***1.0G***	***11.3DSTN***	***6X***	***$2398***
3900	P133	16M	1.0G	11.3DSTN	6X	$2748
4000	P150	40M	2.1G	12.1TFT	10X	$5498

IBM-ThinkPad

385XD	P120	8M	1.08G	10.4DSTN	4X	$2578
385XD	P120	8M	1.08G	10.4TFT	4X	$3048
385XD	P133	16M	1.4G	11.3DSTN	6X	$3198
385XD	P133	8M	1.4G	11.3TFT	8X	$3798

NEC-Versa

2400	P100	8M	810M	11.3DSTN		$2048
2400CD	P100	8M	1G	11.3DSTN	6X	$2498
2430CD	P133	16M	1G	11.3DSTN	6X	$2798
2650CD	P150MMX	16M	1G	11.8DSTN	6X	$3898
4230CD	P133	8M	1G	10.4TFT	6X	$3893

ACER-Acernote

356	P100	8M	810M	10.4DSTN	$1898
381	P120	16M	810M	10.4DSTN	$1988

Drives

1.3GB Fujitsu / Seagate	$236
1.7GB Fujitsu / Seagate	$260
2.1GB IBM / WD	$298
2.9GB Maxtor / Fujitsu	$328
3.2GB Quantum / WD	$368
4.0GB WD	$488
6.0GB Seagate	$738
2.1GB Quantum SCSI II	$428
2.1GB Seagate SCSI U/UW	$478/788
4.3GB Seagate SCSI U Wide	$1268
4.5GB Quantum SCSI U Wide	$1298

HDD Controllers

Adaptec 2940 PCI SCSI Kit	$280
Adaptec 2940UW PCI SCSI Kit	$328
Adaptec 3940W PCI SCSI Kit	$630

ZIP / JAZ Drive

100MB ZIP Drive Para/SCSI	$280
1GB JAZ Drive SCSI int/ext	$520/628
100MB ZIP Disc 1/10pcs	$19/178
1GB JAZ Disc 1/5pcs	$125/628
Panasonic 4x CD/Optical Drive	$960

Tape Backup

Ditto 800MB Int/Ext TBD	$188/198
Ditto 2GB/3.2GB Int	$250/328
Colorado T1000 800M Int/Ex	$178/218
Seagate 3.2GB TR 3 Int. TBD	$298
Traven TR1 / TR3 Tape	$38/75

Modems

Acer 33.6 Full Duplex Voice Int	**$120**
Supra 33.6K Int. Voice/Fax/M	**$118**
USR 33.6K Int /Ext	$138/218
USR 33.6 Full Duplex Voice Int	**$160**
USR 33.6 Full Duplex Voice Ext	$248
Diamond Video Conferencing Kit	$488
USR Big Picture Video Phone Kit	$498

Multimedia

Panasonic 8x/12x CD-ROM	$128/138
Hitachi 12x/16x CD ROM	$138/168
Pioneer 12x SCSI CD-ROM	$198
Acer 16bit PnP Sound Card	$38
Soundblaster 16 PnP /32 PnP	$80/138
Soundblaster AWE 64 PnP	**$248**
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Backpack 4x CD-ROM / Sound	$398
Yamaha M15 Stereo Speaker	$90
LabTec 3D Speaker & Subwoofer	$145

CD Writer

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HP SureStore 6020i CD Writer	$638
HP SureStore 6020e CD Writer	$765
Yamaha 6x4 Int. / Ext.	$888/998
Yamaha 6x4 Int. / Ext. kit	$1088/1198
Sony / TDK Blank CD Media	$9

Monitors

Proview 14"/15" N-I L/R	$224/308
MAG 15" 1595/ 17" 1795	$468/628
NEC 15" C500 / 15" XV+	**$478/518**
NEC 17" M700 / XV+	$1048/988
Panasonic 17" S17	**$868**
Samsung 15" GLe / GLi	$438/488
Sceptre 15" N-I L/R PnP	$368
Sceptre 17" JT35 Multimedia	**$728**
Sony 15" 100SX / 100SF	$550/638
Sony 17" 200SX / 200SF	$998/1188
Sony 17" SE2T 1600 x 1280	$1398
Sony 20" 300SFT 1600 x 1280	$2288
Viewsonic 15" 15GS	$488
Viewsonic 17" V775	**$868**
Viewsonic 17" 17GS/17PS	**$868/988**

Video Cards

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S3 3D Virge 2M/4M	$68/95
ATI 2M EDO /3D Xpression	$88/118
ATI 3D PC2TV 2M/4M	$168/188
ATI 3D Pro Turbo PC2TV 8M	$248
ATI TV Tuner Card	$138
Creative Lab 3D Blaster 4M	$248
Diamond Stealth 3D 2M	$138
Diamond 3D 3400 4M VRAM	$310
Diamond 3D Monster 4M EDO	$315
Matrox Myst. 3D 2M/4M SG	**$178/228**
Matrox Mill. 3D 2M/4M W	**$248/338**

PCMCIA

28.8K PCMCIA Fax/Modem	**$168**
3Com EtherLink III PCMCIA	$180
Adaptec APA 1460 SlimSCSI Kit	$238
MegaHertz XJ10BT 10BaseT	$185
MegaHertz XJ4288 28.8 M/fm	$298
MegaHertz XJ4288M 28.8 Cel	$328
MegaHertz 33.6K + 10BaseT	$425
Motorola 28.8K Fax/Modem	**$248**
USR 28.8K FaxModem	$208

RAM/CPU

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72pin 4M / 4M EDO	$30
72pin 8M / 8M EDO	$60
72pin 16M / 16M EDO	$115
72pin 32M / 32M EDO	$225
AMD K5-90/256K/E IDE PCI	$190
P 120/256K PBC/E-IDE PCI	$285
P-133/256K PBC/E-IDE PCI	$328
P 166/256K PBC/E-IDE PCI	$478

Networking

ISA 16bit Ethernet Combo	$38
GVC PCI Ethernet Combo	$68
3Com 3C509B PCI 10BT	$150
3Com 3C905 TX PCI 10/100BT	$188
NT Server 4.0 5 / 10 User	$898/1238
NT Station 4.0	$290

Printers

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Canon BJC-4100 Color	**$298**
Canon BJC-4550 17"x11" Color	$598
Epson Stylus 400/800	$338/408
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HP DeskJet 820Cse / 870C	$510/650

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Brother HL760DX 1200x600dpi	$598
HP 5L 600dpi 4ppm 1MB	**$548**
HP 6P 600dpi 8ppm 2MB	$988
HP 5 / 5N / 5M	$1728/2128/2468
HP 4V/5Si/5SiMx	$2598/3678/5150
Fujitsu 10ppm/14ppm	**$698/798**
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Lexmark OptraR+ 1200dpi 16p	$1785

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HP ScanJet 5P / 4C	$510/1088
Microtek ScanmakerE3 Flatbed	$318
Microtek Scmk E6 Sld/Pro	$488/768
U Max 6E Pro	$735

Multi-Linguals

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Chinese Gateway & 3x3 Pen	$346
FineArt GeGo 8x4 Pen System	$288

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CeBIT'97

A six-day tour of all that's new in technology

BY PATRICK MATTERN

I was warned! CeBIT is big, demanding, and can be draining. Well, here I am laid out in bed after six days of CeBIT (I am sure it had nothing to do with the regularly scheduled evening events that take you into the morning). Let's just say next year I am bringing my sneakers, high protein supplements and attending only half of the social events. The CeBIT exhibition in Hanover, Germany has been an annual event since 1970. Every year, the number of exhibitors, floor space and visitors grows. At CeBIT 97 there were 6 855 exhibitors from 65 countries occupying 352 423 square metres of floor space. The final visitor attendance is an estimated 610 000. CeBIT has witnessed the rapid growth of the information technology and telecommunications industries and each year highlights the hottest products and services on the market. This year, for example, multimedia products and services consumed two massive halls and included 380 exhibitors. CeBIT continues to draw attendance from all major manufacturers and developers in addition to start-up companies. As a result, its stature as a global information technology exhibition continues to grow.

Major announcements

CeBIT offers a prime opportunity for manufacturers and developers to introduce new products and services to the press and to the European audience. This year, announcements of particular interest came from Intel, Microsoft and Apple.

In a joint press conference, Intel and Microsoft announced the NetPC Reference Specification for industry review. The NetPC is a new class of computer aimed directly at the business community's desire for lower "total cost of ownership." Valued at under US$1 000, the NetPC is intended to be managed remotely, automatically configured and installed, and updated in off-peak hours. Modifications include the elimination of the ISA slots and enclosing the system in a sealed case. It is expected that NetPC product announcements will be issued over the next 90 days.

This announcement fuels the debate on the future direction of desktop computing. In one camp we see companies like Oracle, Sun and Corel promoting the advantages of the Network Computer (NC). The other camp, with industry titans Intel and Microsoft, would prefer the world follow the path of the NetPC. There is little doubt that the move towards inexpensive NCs running applications from servers would not bode well for either Microsoft or Intel. With the technical specifications of the NetPC announced, the battle line is clearly drawn. At CeBIT it is apparent that many of the manufacturers are currently taking a neutral position by demonstrating both PC and NC systems.

In addition to the NetPC, Intel revealed the first public demonstration of the new Pentium II processor (formerly known as Klamath). The Pentium II combines Intel's MMX technology with the 32-bit software capabilities of the Pentium Pro processor. Intel has incorporated a new packaging design for the processor called the Single Edge Contact Cartridge. By using a cartridge design, Intel will be able to offer future processor upgrades. The processor speed will be 200 MHz and higher. It's slated for release internationally in the second quarter of 1997.

For the Apple community there was the introduction of a special 20th Anniversary Macintosh. It was designed to be a futuristic entertainment centre that includes a computer, built-in TV/radio tuner/video inputs, and customized Bose speaker technology. The system has a polished ultra slim metal case that contains a 12.1 inch active matrix screen, a 250 MHz RISC PowerPC 603e processor, 32 MB RAM, 2 MB video RAM, a 2 GB hard disk and a 33.6Kbps GeoPort modem. The demonstration of the multimedia system (complete with video clip by musician Peter Gabriel) was impressive. You might want to put your request in early because there will only be 12 000 systems produced. However, with a price tag of US$9 000 you won't have to worry about me taking your place in line.

Continued on page 45

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- 3.5" 1.44Mb Floppy Drive
- ATI 3D ProTurbo PC2TV w/4MB SGRAM (8MB max)
- 12X EIDE CD-ROM
- SB32 wavetable sound card
- Shielded 120w Amp speaker
- 104-key keyboard & MS serial Mouse
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- P815 .... $2195
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- V773 17" .... $ 810

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- M500 .... $ 560
- M700 .... $1130
- P750 .... $1350

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- 15GLi .... $ 510
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- 1.6GB ST31640A........ $ 295
- 2.1GB ST32140A........ $ 325

SCSI

- 2.1GB ST32430W........ $ 995

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- HL 760 1200dpi 6ppm .. $ 625

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- Stylus 400 .... $ 350
- Stylus 600 .... $ 600
- Stylus 800 .... $ 618

Canon

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- BJC-4100........ $ 320
- BJC 70 .... $ 395

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- HP-692 .... $ 485
- HP-820 .... $ 815
- HP-870 .... $ 640
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Processor	P-120	P-133	P-133	P-133	P-100	P-120	P-100	P-100	[illegible]	[illegible]	P-120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Display type	10.4" TFT	11.3" TFT	11.3" DSTN	12.1" TFT	11.3" DSTN	11.3" DSTN	11.3" TFT	11.3" TFT	13.3" TFT	11.3" DSTN	12.1" DSTN	12.1" SVGA	12.1" SVGA	13.3" XGA	11.3" TFT	12.1" TFT
Memory	[illegible]	[illegible]	[illegible]	16MB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hard Drive	1.08Gb	1.3Gb	2.1GB	2.1GB	772MB	1.3GB	1.3GB	1.3GB	2.0GB	810MB	810MB	1.3GB	2.1GB	2.1GB	2.1GB	2.1GB
PC card type	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CD-ROM	6X	6X	N/A	Opt	6X	10X	10X	10X	10X	na	na	6X	10X/336MD	10X	10X	10X/336M
16-bit Audio	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Software	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$3,090	$3,795	$3,M20	$M,0MS	$2,1MS	$2,705	$3,620	$M,355	$6,2MS	$2,120	$3,375	$5,2M0	$M,350	$M,620	$5,620	$M,690

CeBIT'97

Continued from page 43

On the exhibition floor

As mentioned previously, multimedia was one of the key markets to watch this year. Much of the excitement in this area stems from the introduction of DVD (digital video disc) technology. With double sided, double layered disc storage capacity reaching a staggering 17 GB, it is easy to understand why it has cross-industry appeal. The consumer electronics market sees it as a replacement for the VCR, the computer industry (including game developers) like the storage and multimedia capabilities, and the entertainment industry see it as an excellent means to distribute movies and to enhance the quality of the movie delivered into the home. So with all these benefits, why hasn't it made a bigger splash?

Two reasons are suggested: the demand Hollywood has put on DVD manufacturers to provide regional coding to prevent people from watching movies that have not yet been released in their home market, and perhaps the bigger issue, the ability of DVD to record data. Currently only DVD players are available—units capable of recording are expected to be available by the end of this year. By the end of 1998, fully recordable/erasable DVD should be available.

Another technology that was well represented throughout CeBIT was Intel Pentium MMX. Every PC manufacturer's stand demonstrated the multimedia power of the MMX.

The World Wide Web commanded a overwhelming presence on the floor at CeBIT'97. Service providers, modem manufacturers, Web designers, and consultants were in abundance. In Europe, Internet use continues to grow, but still falls behind North America. In North America, Web surfers pay a monthly charge with some extra charges tacked on if their monthly connect time limit is exceeded. In Europe, however, users also pay per minute for the local call to their Internet service provider (ISPs) in addition to the ISP's monthly access fee.

A whole new meaning to "baud" (bod?) rate

Under the strange but true category, IBM introduced the PAN—Personal Area Network. As a product it is only in its demonstration phase. In brief, the technology uses the human body as a medium to transfer electronic data between PDAs (personal digital assistant).

IBM suggests the potential for such a system would include patient identification, electronic commerce, security, and transferring information between cellular phones.

The European story

While admittedly Europe lags behind North America in developing and implementing computer technologies, one area in which they outshine their colonial cousins is mobile communications. While North America tries to decide on a standard implementation for digital cellular, the GSM (Global System for Mobile Communications) world has progressed rapidly. Last year saw the release of Nokia's uniquely designed 9000 model GSM—a digital cellular phone that opens to reveal a PDA. Not only does it allow you to call to order your favorite pizza, but you can also cruise the Web and receive faxes while you wait for delivery.

The Canadian presence

Canadian companies were well represented at CeBIT'97. Aside from prominent players like Corel and Newbridge, there were a number of smaller companies looking to expand their international markets. A few of the interesting products included PhotoSuite from MGI. With this program, you can be your own photo editor and graphics designer, producing professional business presentations or designs at home. A product definitely worth taking a look at.

Another Canadian talent is 01 Communique's Communicate! The world of PC fax software has changed. Features offered by Communicate! include the ability to record conversations, to have your PC automatically convert and forward incoming faxes to email (and vice versa) and a very friendly user interface.

Corel chose CeBIT'97 to relaunch its European operations. An unveiling of the prototype Video Network Computer (Video NC) and Corel Office for Java was packing in the audiences.

A small company with a big story had to be CS&T of Montreal. CS&T is a developer of an enterprise-wide scheduling and resource manager called CorporateTime. It is a client/server application designed to reduce the workload of organizing people and resources across an enterprise. CS&T's client base reads like the Who's Who of multinational corporations. In addition CS&T has licensed its technology to Netscape in order to be incorporated into Netscape's Intranet client and server software lines. ❑

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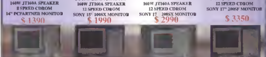

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[illegible]00CDT	P120 MHX	[illegible]	1.3GB	10X	11.3TFT
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TCP LAB TEST

Three gigs and bigger

New technology and larger hard drives put an end to the storage crisis ... for now

BY STEVE HALINDA AND TIM BINGHAM WALLIS

When buying a computer everyone wants to get the most value for their hard earned money. Foremost on many minds is maximum performance, trying to make their systems run as fast as physically possible without spending a year's salary in the process. Sometimes compromises will be made—getting more RAM in exchange for a slightly slower processor or maybe spending an extra $100 for a superior video card. But what about our old friend the trusty hard drive? How important is it to you in terms of a reliable storage device, and how far will it go towards improving your system's overall performance?

Advancements in drive technology over the past few years have gone a long way towards ensuring that your hard drive will be more reliable. Hard drive crashes are far less frequent these days, making your priceless data all that much safer. But can choosing a particular drive over another really make a noticeable difference where performance is concerned? The answer is absolutely, without a doubt, yes! Although the primary function of a hard drive is to serve as a data storage device, choosing the right drive can definitely save you both time and money.

It's always amazing to see how much things can change in this industry in the span of one short year. Around this time last year our hard drive tests were conducted on an assortment of drives ranging in size from 1 to 1.6 gigabytes (GB) with the larger size costing roughly $400. Today that same $400 will buy you a drive with more performance and double the capacity.

This month, we look at drives with EIDE (Enhance IDE) interfaces with starting capacities of 3 GB all the way up to the 6.4 GB monsters. We chose to test the EIDE variety simply because it's far cheaper to buy a drive with this interface than a drive identical in size but with a SCSI interface. Also, EIDE drives are much more common in systems aimed at the home user, and come in a wide variety of models and sizes to suit every need.

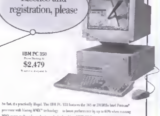
Our decision to test drives with minimum capacities of 3 GB was based on two things. First is the fact that you get a far better bang for the buck when you buy a drive with a larger capacity. A typical example is the price difference between a 1.2 GB and a 3.1 GB drive. Flip through the pages of this month's paper and you'll see what we mean. A 1.2 GB drive will have an average street price of around $270, whereas a 3.2 GB drive will go for roughly $420.

If you're in the market for a new drive but have to watch every last dollar you spend, then you may have no choice but to go for the smaller drive. However, if storage space and performance are your primary concerns, then it's easy to see how the extra $150 will be very well spent to get an extra 2 GB of space, as well as the performance benefits that are certain with the newer model drives.

The other deciding factor was the ever growing need for more space. What may have been more then enough storage space a year ago is very quickly becoming today's bare minimum.

How big is large?

As everyday applications and operating systems become more sophisticated, they also become quite notorious for hogging precious hard drive space. For example, a complete installation of MS Office 97 Professional Edition requires 207 MB. A "typical" installation of CorelDraw 7 requires 211 MB, with the complete install taking up as much ➤



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as 403 MB!

These are only two applications and although they are certainly among the largest it is definitely a sign of things to come Remember when your applications required what was then a measly 2 MB or 3 MB to install? Well those days are long over and we can look forward to more of the space-hungry variety especially with the onset of DVD based programs just around the corner. Kind of makes you wonder if a 650 MB CD ROM-based application can require as much as 200 MB (as in the case of MS Office 97 Pro) what's in store for us when 4 5 GB DVD titles hit the stores?

But even before the onslaught of DVD titles we have plenty to consider with the several thousand programs currently available Some need hardly any hard drive space while others will try and hog nearly every last precious byte

All applications aside the operating system you prefer will also be a determining factor in how large your hard drive will be Good ol' DOS was the most disk-space friendly, requiring roughly 5 MB for a complete install, including all those useless files you'll never in your life have any use for Windows 3 1 and Windows for Workgroups 3 11 weren't all that different requiring just a few MB more Then came Windows 95, very popular today and found on many hard drives eating up anywhere from 30 MB to 80 MB Among the more space-hungry are Windows NT Linux and other flavors of Unix

Needless to say precious hard-drive space is something you can never have too much of Well okay maybe you can If you obsess over two or three particular games and you have one of these new 6 4 GB drives containing nothing but add on levels well you get the idea

Aside from the space your applications will require you will also want to consider how much room your data will need Depending on what you do with your computer on a day to-day basis, this can be one of the most important factors in deciding on the size of drive to buy If most of your work is centered around word processing or spreadsheet calculations, it may be a while before you run low on space

On the other end of things, there are those who work with graphics-intensive files. In the publishing business especially a single file can easily run you into the tens of megabytes. And if you have to work with more than a few of these at any one time or if an entire collection must reside on your drive at all times you can easily imagine how quickly a gigabyte or two will be used up.

Another area where drive space is of great importance is in audio and video editing, where just a few minutes worth of digital data will eat up massive amounts of space

These are only a few of the many examples where it seems you can never have too much hard-drive space Since the cost per megabyte is at an all time low it may be worth working out a rough estimate of how much space you'll actually need, and factoring in what we often refer to as "breathing room" There s nothing worse than going out and buying a brand new drive double the size of your current one only to find it three quarters full in under a month With the way things are right now we feel that a drive with a capacity of 3 GB will not only meet most consumers needs but will also give them some overhead for the future Let s face it, nobody wants to buy a new hard drive every six months which is why we recommend planning ahead

And you shouldn't worry too much about spending a lot of money on a new drive only to see it advertised for half the price a few months later Last year, 1.2 GB capacity hard drives were selling for around $350 Those same drives today are selling for $270 What this shows is that hard drive prices don t really drop significantly in a short period of time, but as new technology becomes available the new line of drives will sell for the same price that the old line once did

The new line of drives having capacities of 3 1 GB are selling for around $400 today By this time next year 3 1 GB drives could very well be replaced by 5 and 6 4 GB units (today s high-end models), and will probably sell for close to the same amount of money

The faster the better

Your computer s central processing unit (CPU) spends a lot of time waiting for your much slower hard drive to catch up While operations inside the CPU are timed in nanoseconds (one billionth of a second) your hard drive operations are limited to mere milliseconds or thousandths of a second Although considered very fast by human standards a millisecond is actually 1 000 000 (one million) times slower than a nanosecond! Comparing the speed of your CPU to your hard drive is like comparing a Ferrari to a turtle

The most obvious reason for this great dif

Continued on page 50

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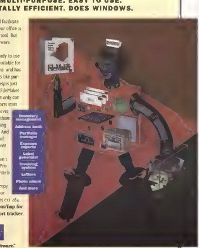

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Hard drives

Continued from page **48**

ference is that your CPU does all of its work at microscopic levels, whereas your hard drive is composed of mechanical parts such as motors, platters and read/write heads Try as you may, you'll never get a conventional hard drive to be anywhere near as quick as a processor because of the physics involved

So when you're loading your favorite word processor, for example your CPU will have to wait until your hard drive can access all of the necessary data and load it into RAM (which also operates in nanoseconds by the way) before it can proceed and give you a blinking cursor, at which point you're ready to type away

If you want to see exactly what we mean for yourself, try the following. You'll need a fair amount of RAM and a working knowledge of DOS Reboot your system into a DOS session, and create a RAMdisk of a few megabytes. If you still have a copy of WordPerfect 5 x (or other medium sized DOS application) copy all of its files into the RAMdisk and load the program Before you could even blink you'll be greeted by the standard title screen and you're ready to go What you've just done is loaded an application from RAM into RAM. Under everyday circumstances you would load the program from your hard drive into RAM By creating a RAMdisk (or virtual disk), you've tricked DOS into thinking that you have another hard drive, which is actually a chunk of RAM set aside and made to look like another drive As we said earlier operations in RAM are timed in nanoseconds, as are those in the CPU By feeding information from RAM to your CPU directly without the need of a hard drive, you've bypassed a major bottleneck which is always present when information must travel to the processor via the hard drive

But back in the real world, we have to make do with what we have And that means, at least in the immediate future, conventional hard drives will be with us and they will serve as the storage medium of choice for some time yet. So long as that's the case, you might as well get to know what makes one hard drive perform better than another and help minimize the wait

Under the hood

A hard drive is made up of several unique components all of which work together to give us an indispensable device we use every day to store countless bits of digital information The most popular of these components are the platters and the read/write heads The platters are disc-shaped usually made out of aluminium or glass Unlike the flexible media in floppy diskettes, these platters cannot bend or flex, which is where the term hard disk comes into play Another popular term to describe a hard drive is fixed disk which is derived from the fact that the platters are fixed firmly in place and are not removable

Physically the operation of a hard drive is similar to a floppy diskette drive the discs spin while the heads move over them to store or read data in tracks and sectors Hard drives contain multiple platters with two sides each, where data is stored For every platter there is a read/write head all of which move across the discs at the same time since they are all connected to one arm

Continued on page **53**

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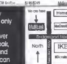

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Coretest										
Buffered read (KB/sec)	14144.0	14144 0	13692.7	14148 3	14132.8	13472.0	11514 7	13862.7	14133.3	14064
Sequential read (KB/sec)	8865.3	8672 6	8804 [illegible]	5822 0	8705 3	6860.3	7077.5	6800	8886	9552
Random read (KB/sec)	2336	2940 3	2325.[illegible]	1766.7	3034.4	2213.3	2320	1909 3	3066 7	2341.3
Average seek time (ms)	9.2	7 1	8.0	12.2	10 0	8 0	12 9	10 6	9.83	10.9
Track to-track seek (ms)	2 7	2.3	2.8	5.6	2.0	3.5	3.5	3.5	2.5	2.5
GBENCH										
Data transfer rate (KB/sec)	5706 7	6680.6	4846.7	4900.0	5903 3	3826.7	3583.3	5046 7	5736.7	6570
Data access time (ms)	4 6	3 8	3.6	7.0	3.8	6 1	8.3	7 4	[illegible]	6.8
Norton Sysinfo 8.0 for DOS										
Data transfer rate (KB/sec)	3311 1	3367.5	3228.2	2811 9	3706.6	2956.8	2513.5	2881 6	4012.9	3985 2
Average seek time (ms)	8 22	5.38	7 71	12 4	8 03	6 51	12 48	10 8	6 03	10 65
Track-to-track seek (ms)	1 95	N/A	1.8	4 58	2 27	3.0	3 13	3.2	2 47	2 4
Sysinfo 2.0 for Win95										
Cached reads (MB/sec)	24.[illegible]	23.9	24 1	23.7	24 1	24 6	24.8	24.7	23.8	[illegible]
Cached writes (MB/sec)	28.[illegible]	28 6	27 7	28.8	29.0	27.1	27 8	28.8	28.7	30.[illegible]
Physical benchmark (MB/sec)	5.2	5 3	6.3	3 7	5 2	[illegible]	4 4	[illegible]	8.6	5 2
File copy tests										
Large dir. transfer time (sec)	76 1	68.03	75 76	56.8	32.35	75 77	106 3	87.49	68.27	[illegible]
Large file copy time (sec)	28 89	28.02	[illegible]	46.5	37 6	[illegible] 2	40 8	39.6	30.1	34 3
Drive specifications										
Formatted capacity (GB)	3 5	[illegible]	[illegible]	[illegible]	[illegible]	3.8	[illegible]	3 2	[illegible]	4
Form factor (inch)	3 5	3.5	3.5	[illegible]	3 5	3.5	5.25	3.5	[illegible]	3.5
Interface type	ATA-3	ATA 3	ATA-2	[illegible]	ATA-3	ATA-3	ATA-2	ATA-3	ATA-3	ATA-2
Buffer size (KB)	128	128		128	256	128	128	128	512	256
Average seek (ms)	10	10	8.5	12	10	10 5	<14	12	11	11
Spin rate (RPM)	5 400	5 400	5,400	4 480	5,400	4,500	3,600	4,500	5 400	5,200
MTBF (hours)	500 000	500,000	n/a	400,000	[illegible]	400 000	300 000	300,000	500,000	350,000
Acoustic noise (dBA)	36	35	n/a	37	[illegible]	[illegible]	34	34	30	
Warranty	3 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years
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For benchmark figures where numbers are measured in ms, the lower numbers represent better scores.
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Although it is these heads that are responsible for writing data to the discs, they will never actually come into physical contact with the platters. These heads are kept suspended by an extremely thin cushion of air, and thereby float just a fraction of a millimeter above or below the platter. If dust or other small particles ever get into this part of the drive, it would easily be enough to cause the head to come into contact with the platter and do physical damage to it. Also, if a sufficiently large shock were to be applied to the drive while under power, the force could be enough to cause the heads to go crashing into the spinning platters and once again causing physical damage to the drive, not to mention data loss. This is known as a "head crash."

Special precautions have been taken to ensure that dust and other such particles never get into the area of the drive where damage can occur. The portion of the hard drive where the heads and platters are is sealed, making it nearly air tight. It is important to note that hard drives are very fragile devices, and special care should always be taken when handling them.

Drive performance

When deciding on what drive to buy, your first consideration should be the size of the drive. This is something that is entirely dependent on your specific needs and cravings. Once you've decided on the size of the drive, you'll want to know performance characteristics about the drive. These are the factors that will determine how the drive will perform. You should be looking for a low average seek time on the drive (measured in milliseconds or ms) and a high spin rate (measured in RPMs or revolutions per minute). The average seek time of the drive is the amount of time it takes for the heads to move from one cylinder on the drive to any other cylinder. Another number you'll be concerned with is the average access time, which takes into account the drive's latency. Latency is defined as the average time (in milliseconds) that it takes for a sector to be available after the heads have reached a track. This figure is generally half of the time it would take for the disk to fully rotate once. On a drive with a spin rate of 4 500 RPM, a full rotation would take 13.33 ms, thereby making your latency equal to 6.67 ms. The average access time of the drive is the sum of its average seek time and latency. This gives us the average amount of time that is needed before a sector (chosen at random) can be accessed.

The other important factor you will want to know is the maximum transfer rate of the drive. Transfer rates come in two different flavors: a disk transfer rate and a host transfer rate. The disk transfer rate represents the speed at which data is moved to and from the drive. This is the number most often reported by hard-drive benchmarking software because it shows you the actual number of kilobytes that can be transferred in any given period of time. The disk transfer rate of a drive depends on the spin rate of the drive. A drive with a spin rate of 5400 RPMs will outperform a similar drive at 4500 RPMs.

The host transfer rate represents the speed at which the CPU can access information from the EIDE controller. It's safe to say that all drives and system BIOSes manufactured as of last year will have support for PIO (Processor Input/Output) Mode 3 and Mode 4. The maximum theoretical transfer rate for PIO Mode 3 is 11.1 MB/sec and 16.6 MB/sec for PIO Mode 4.

We recommend drives with average seek times of 12 ms and under. Some of the drives tested even go below the 10 ms mark. As far as spin rates go, aim for a drive that can reach at least 4,500 RPM. A few drives even got as high as 5 400 RPM—not long ago these spin rates were found only on SCSI drives. A combination of a low average access time and high spin rate is a sign of a drive that will deliver maximum performance.

Doing the splits

One of the very first things you'll need to consider after purchasing one of these large drives is how you're going to partition it. What's that, you ask, and why can I I have all of my data on by brand new mammoth drive? Well, you can, but it all depends on what operating system(s) you use.

Every file you store on a hard drive relies on some kind of file addressing system to organize all your data. Among PCs, the most common file system is known as FAT (File Allocation System). It's been around for a long time and is found on every PC running DOS or Windows from here to Zimbabwe.

Windows 95 uses a modified version of FAT called VFAT (no, it doesn't stand for "very fat," but for virtual FAT), which adds support for long filenames. OS/2 can access FAT as well, but its support for HPFS (High Performance File System) allows it to overcome the limitations of the FAT system, while at the same time adding support for partition sizes up to 2 terabytes (two thousand giga-

Continued on page 56

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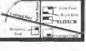

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Hard drives

*Continued from page **54***

bytes). Windows NT supports both FAT, HPFS as well as its own NTFS format. NTFS is the most advanced file system of the bunch. It allows access to partitions up to 16 PB (petabytes) in size. (If you don't know what a petabyte is, don't feel bad, neither does the majority of the planet. It's equal to 16 million terabytes—16 followed by 18 zeroes.) Rest assured you won't find any hard drives quite that large in the near future.

But no matter what file system your OS uses, each must adhere to certain rules when it comes to storing your files. Each file system must organize data into segments called clusters. Under the FAT file system, the maximum size of any one cluster is 32KB (32,768 bytes). Furthermore, the maximum number of these clusters is limited to 65,536. When you multiply these two numbers, you come up with what has come to be termed the "2.1 GB barrier," referring to the maximum number of bytes that can be allocated on the drive, which in this case is 2,147,483,648 bytes, or 2.1 GB.

So what happens to that extra space on these larger drives? Can you make use of it if you happen to be one of the many millions of people relying on the FAT system? Absolutely, but you'll have to perform a few extra steps before doing so. As mentioned earlier, you'll have to divide your drive into partitions and make sure that your largest partition does not exceed 2.1 GB.

Most drive manufacturers include some kind of disk-based utility that ships with your drive, which will help you do this easily and accurately. If not, you'll need to use a utility called FDISK that comes with DOS. Follow the instructions as outlined in the documentation you receive with the particular setup software or the DOS manual.

Deciding on what size partitions you want to create is important not only because it will allow you to use your drive to its full capacity, but will also determine how much of that space will be used effectively, and how much of it will go to waste.

Let's say you just bought a new drive with a total capacity of 4 GB. There are several ways in which you can partition it, but most people would choose to go with two partitions, each with a capacity of 2 GB, just because it seems simple enough. And although it's certainly possible, here's why you may not want to. Under the FAT system, your cluster size is determined by your partition size. Here's where it gets interesting!

Earlier we said that the maximum number of clusters you can have on any one drive (or partition) is 65,536, or 64KB clusters. By dividing the partition size by the maximum number of clusters the drive can hold, we get the individual cluster size. So, let's say you wanted to make a 512 MB partition and wanted to know how big the clusters would be. We divide 512 MB by 64KB, which gives us 8KB. So what's the big deal? Why the math lesson? Here's why: it so happens that every file on your hard drive must occupy at least one cluster. This means that if you had a tiny batch file which was 157 bytes long, the FAT system would automatically allocate an entire cluster to that file, despite the fact that it's so small. So on a 512 MB partition, that 157-byte file would actually take up an entire 8KB of space!

Don't believe it? Go ahead and try it! Make yourself a small file using Notepad in Windows or Edit under DOS and type in just a few characters and then save the file. Open up a DOS box (unless you're already in DOS) and change to the directory (or folder) where you created your file. Type "dir" to get a directory and notice your small file occupying just a few bytes of space, or so you think. Also take a look at the number of bytes free at the bottom of the list. Now delete the file and type "dir" once again. Check the number of bytes free once again, and do a bit of arithmetic. You'll quickly notice that the numbers don't add up. By deleting that small file, you've actually freed up an entire cluster on the hard drive.

Now you can bring on the fat jokes. And yes, you guessed it. The larger the partition size, the larger the cluster size. So if you did go ahead and make a 2 GB partition, keep in mind that your cluster size will be a whopping 32KB! Can you imagine the amount of disk space you would be wasting if the majority of files on your drive were considerably less than 32KB in size?

To prevent many unnecessarily wasted megabytes, we recommend you make your partitions only as large as you need to. If possible, use 1 GB or less and only resort to 2 GB if you absolutely need to have all that space on one drive. Using smaller partitions will also give you better performance because your applications won't have to sift through so many megabytes of files in order to find what they're looking for. Also, maintenance tasks such as defragmenting the drive will

*Continued on page **58***

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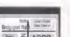

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Hard drives

Continued from page 56

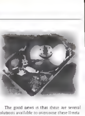
take considerably less time if the partition size is smaller

It's worth noting that the HPFS and NTFS file systems do not suffer from this limitation The HPFS file system has a fixed cluster size of 512 bytes—the same as a floppy diskette This greatly reduces the amount of wasted disk space and file fragmentation but at the same time imposes a 2 terabyte (TB) limit on the partition size Similarly the NTFS system uses cluster sizes ranging in size from 512 bytes up to a maximum of 4KB Once again, wasted disk space is nearly a thing of the past but because of the support for cluster sizes up to 4KB, partition sizes up to 16 PB are possible

BIOS limitations

When the Enhanced IDE interface came into existence it improved upon the old IDE standards in quite a few ways. It broke the previous 528 MB capacity barrier provided faster transfer rates with the introduction of PIO Mode 3 and Mode 4, provided support for up to four IDE drives and also non-disk devices such as CD-ROMs with ATAPI support.

Despite all of these improvements, there were still limitations found in system BIOSes If you have a system that was purchased prior to 1996, there's a good chance that your BIOS won t be able to recognize the full size of the drive



The good news is that there are several solutions available to overcome these limitations The first thing you should do is to find out whether or not your BIOS is flash upgradable Check your motherboard or system manual for details or contact the manufacturer of the motherboard If the BIOS turns out to be flash upgradable, you can update it in just a few seconds, giving you the most up-to-date version The more popular motherboard manufacturers have the flash utilities online for the general public to download, as well as the data files required to program the BIOS with the latest information.

However, if you're stuck with a non flash upgradable type the next best solution is to contact the motherboard manufacturer and obtain the latest ROM chip Make sure the new ROM has support for large hard drives with capacities of 2 5 GB or greater Expect to pay anywhere from $40 to $100 for a new ROM chip assuming of course that the manufacturer has them available

The third possible solution is to work around the problem with the help of additional software Every drive we tested in this survey came with some form of disc based hard drive management utility to get you up and running in just a few minutes

When numbers lie

Our riddle of the day asks "when is a megabyte not a megabyte?" The answer It depends on what numbering system you're talking about Drive manufacturers almost always refer to one megabyte as being one million bytes

To be sure always read the documentation that accompanies the drive The story goes that when computers deal with data, they need to have everything addressed in Base-2 meaning two possible digits, in this case 0 and 1 We as humans on the other hand, are quite fond of the Base 10 system which uses 10 digits ranging from 0 to 9

If a computer has to count up to 1 MB it has to do so using the Base-2 system To a computer 1 MB is known as 2^20 (2 to the power of 20) which is equal to 1 048 576 bytes To a drive manufacturer that same 1 MB is known as 10^6 (10 to the power of 6) or 1 000 000 bytes.

So why should you care either way? Because if you take a look at what some programs report as far as your drive size you'll get varying results. For example CHKDSK in DOS will tell you the size of your drive or partition using the binary system This means that if you have a 2 GB partition CHKDSK will report it as having 2,146,467 840 bytes Likewise your system's BIOS will tell you that your 3 1 GB drive is actually 2 9 GB

The point we want to make is that there is no cause for alarm—you haven't been ripped off either way It just depends on who's definition of "megabyte" you're using

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The tests

We used several well-known benchmark programs used to measure the performance of hard drives. Each of them, as can be expected, gave different results for the various tests. Measurements were made on various methods of data transfer, such as sequential and random. Each program provides a report on some form of access time measurement, although they don't always match the numbers specified by the manufacturer. All in all, they each tell a tale of just how quickly a particular drive can perform a given function.

Just to make things interesting, we decided to do a little test of our own—something quite simple, but also very useful because it goes beyond the benchmarks and provides you with a common, everyday scenario. The test actually consisted of two parts. First, we generated a 50 MB file and copied it from one directory on the drive to another and timed the process from start to finish. This is a real world test of a sequential read because the file we were copying was contiguous.

Our second test consisted of copying two directories from one part of the drive to another. These two directories were filled with 489 files and 89 other sub-directories, totalling 51.2 MB. We chose this as the total size to demonstrate how copying 50 MB using two very different scenarios can turn out so different. This test is an example of a random read/write task.

To our surprise, the Maxtor 85120 managed to copy that entire directory tree in just 32.35 seconds, whereas the average among the other drives was closer to 80 seconds. A full defragmentation of each drive was performed prior to these tests to give each drive the exact same testing conditions, and no third-party caching programs were used. We used partition sizes of 1 GB throughout the entire testing process. All of the tests, with the exception of Sysinfo from the Norton Utilities v2.0 for Windows 95, were performed under DOS 6.22.

All tests were conducted on a Pentium 166 MHz machine with 512KB of Level 2 cache and 64 MB of RAM. Each hard drive was configured for Master mode on the primary channel. Each test was executed three times, with the final average being shown in the comparison chart. All prices shown are the average street prices in Canadian dollars, unless otherwise indicated.

In conclusion

This month, we've had the privilege of putting the very latest drives to the test. Each and every drive we tested showed that indeed much has happened in the world of hard drives during the past few years. These new drives boast superior specifications and are constructed with extreme precision.

Deciding on which ones will receive our Editors' Choice award was a slow process. Every factor was weighed and judged accordingly. But in the end, the best of the best managed to shine through regardless of how tough the competition may have been. They've demonstrated superior performance characteristics and have shown that the new breed of mass storage drives has entered the consumer market very dramatically with competitive pricing to make it all the more accessible to just about everyone. ➤

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Editors' Choices

Performance
Fujitsu MPA3052AT
Seagate Medalrst Pro ST36450A

Our performance award this month goes to the fastest overall drive in the survey Usually this award is given to one product but this month we must hand out two because of what the numbers tell us Our two fastest performing drives were the Seagate ST36450A and the Fujitsu MPA3052AT Both of these drives scored extremely well in many of the tested categories.

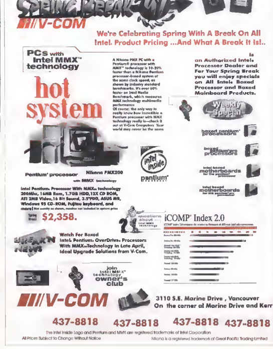
The Fujitsu MPA3052AT is a high performance drive with a capacity of 5.2 GB It managed to score extremely well on our benchmarks, taking top spot in a number of categories The drive uses the new ATA-3 interface has a spin rate of 5 400 RPM and an average access time of 10 ms The list price on this new model from Fujitsu is $650 Because the drive is so new, it was impossible to obtain a street price at the time of this writing. Overall it's an excellent drive, and should definitely be considered if you're looking for a unit with plenty of storage and excellent performance

The Seagate Medalist Pro ST36450A is one of Seagate's latest creations This 6.4 GB drive managed to surprise us in a number of ways First of all all of that capacity is squeezed into a 3.5 inch form factor. Second It achieved some of the best results on our benchmarks in various categories. It has very high transfer rates and low access times, making it the definite choice for someone looking for pure raw performance The drive uses the ATA 3 interface has a huge 512KB buffer a spin rate of 5 400 RPM and an average access time of 11 ms With an acoustic noise level of only 30 dBA, this was the quietest drive in this survey Once again, because this drive s brand new, it was not possible to get a street price on the unit at the time of writing Seagate has many precious years of experience when it comes to manufacturing hard drives, and this Medalist Pro is a testament to that

Overall
Western Digital Caviar AC34000L

If you want a drive that has a bit of everything, get the Western Digital Caviar AC34000L. This new 4 GB drive from WD is one that we would undoubtedly recommend for someone looking for both performance and value.

The drive s unique size is another plus If you feel 3 1 GB is not quite enough and 5 GB or larger is overkill Western Digital designed this drive with you in mind Once again this drive obtained some of the best scores on our benchmark suite Using a large 256KB onboard buffer, a low access time of 11 ms and a spin rate of 5 200 RPM this drive will have no trouble shuffling your data from sector to sector It has an average street price of $493 giving it a mere 12.3 cents per MB usage cost An excellent drive you won t want to overlook ❑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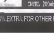

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Multi-function roundup

TCP **looks at the newest desktop equivalents of the Swiss Army knife**

BY ROSS MACDONALD

When we last looked at multi-function peripherals (MFPs) in early '96 it looked as though they were going to be that year's consumer success story. They offered many benefits over individual components at a fairly reasonable price and manufacturers were introducing a whole slew of new models to feed what they'd hoped was a famished consumer market.

Alas, however, such seems not to have been the case in every instance. While MFP sales have been solid, they've certainly been disappointing in terms of what was anticipated. Chances are these products were introduced too late, at a time when most of us had already purchased separate faxes, printers, scanners, et al. Or maybe they just weren't offering abilities attractive enough to draw most of us toward a purchase, as the iniquitous 9.6Kbps modem still shows up in some and the interminable 14.4Kbps in others.

Lexmark got out of the MFP business entirely last spring. "The market just wasn't what we anticipated it would be," Jim Joseph, Lexmark's manager of media relations, explained. (Those who own a Lexmark MFP needn't worry, however; Joseph said the company will support its product through the warranty period. They just aren't shipping any more new units, so you won't find them in our survey here.)

But Lexmark's response to the market isn't to be interpreted as a sign that the MFP is moribund. As you'll see from the following round up of what's currently offered by major manufacturers, prices are largely on the downswing while tech specs are tending rather toward the other direction. And new models continue to hit the retail shelves even as you read this. Ultimately an MFP ought still to be high on most avid computerists and small and home office (SOHO) operators' lists of practical things to consider.

What is an MFP?

A true multi-function peripheral will have five major functions: printer, scanner, copier, fax and faxmodem. Fax and faxmodem are counted as two separate devices despite being centered on the same electronics because your MFP can be used as a standalone fax and as a substitute for your traditional internal faxmodem card. Likewise, the separate printer and copier designations both use the same printer engine but, thanks to software utilities and the built in scanner, the MFP will make copies of just about anything you can feed into the scanner.

I saw my first MFP about three years ago selling for $2,500. The item on display paradoxically cost nearly twice as much as

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buying an inkjet printer ($350) standalone fax ($350) hand scanner ($150), personal photocopier ($400) and faxmodem card ($125) combined The real advantage pushed at the time was economy of desk space over just plain economy

Now the major MFP advantages over individual components have been maximized in saving valuable desk space producing plain paper faxes costing collectively less than individual components and—in some cases—producing color output So you've got pretty good motivation to revisit the possibility of placing one of these space saving devices on your desk.

Brother

Models MFC 690 (MFC890MC)
MFC 1750 (1950Plus) MFC-4550 (6550MC)
From Brother International Corporation Canada Ltd
Estimated street prices $369 (MFC-690) $429 (MFC 890MC) $599 (FC-1750) $699 (MFC 1950Plus) $1 299 (MFC-4550) $1,550 (MFC-6550MC)

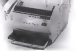
Brother appears to be aggressively chasing the MFP market by introducing six models over the course of 1996 And as you can see from the prices, Brother has managed to come up with a variety of technologies so that an MFP of some sort can be had within just about any budget

Starting at the lower end, the MFC-690 and 890MC are both based around what we might call an enhanced thermal fax engine albeit employing Brother's Anti-Curling System ACS and ThermaPlus Paper, which feels very much like regular old bond. If you can live with that the thermal fax will be your printer and your copier.

Both models feature a 15-page document feeder distinctive-ring detection switch and 49 m (164 ft) paper roll capacity When connected to your computer, both models are also Caller ID ready and 64 grey-scale capable Other faxy features include an electronic cover-page generator, next fax reservation and remote activation Both models are Twain compliant and offer 400 dots per inch (dpi) scanning (interpolated)

The MFC-890MC adds a sixth feature called Message Centre Pro a telephony compartment that works like a professional voicemail system. It can store fax and voice messages in up to five separate mail boxes and store outgoing voice and fax messages for voice/fax-on-demand

Next up in the pecking order are the two inkjet printer engine-based MFPs the MFC-1750 and MFC 1950Plus The 1750 is a more or less typical MFP in offering a 14 4Kbps plain paper fax, 200x400 dpi printer cum copier 400 dpi 64 grey scale Twain-compliant scanner and a PC fax with lots of nifty features like 20-page sheet feeder, 200-page paper cassette and 256KB memory for when that paper runs out Telephony features include the ability to make use of your local phone company's caller ID and distinctive-ring options



The MFC 1950Plus incorporates the message centre as a sixth function. Again you get the five mail boxes and fax/voice message-on demand The 1950Plus also comes bundled with Xerox's very good TextBridge optical character recognition (OCR) software

Finally at the pricier end of Brother's catalogue come the MFC-4550 and MFC 6550MC These two are laser printer based MFPs that might strain the consumer pocket book somewhat but remain economical enough for a SOHO operator

The MFC 4550 offers a 14 4Kbps laser fax through its

Continued on page 68

are working closely with them to create one. Whatever standard is eventually established U S Robotics will offer the easiest possible upgrade path

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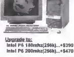

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200CDS • P100/8M/810MB/11.8" DSTN	$2230
430CDS • P120/16M/1.3G/10x/11.3" DSTN	$2700
430CDT • P120/16M/1.3G/10x/11.8" TFT/10x	$3660
500CDS • P120/16M/1.3G/12.1" DSTN	$3060
500CDT • P120/16M/2.1G/10x/28.8k/12.1" TFT	$5630
510CDT • P133/16M/2.1G/12.1" TFT/10x	$5800
660CDT P150/16M/1.4G/11.3" TFT/10x	$6520
740CDT • MMX-P166/16M/2.1G/12.1" TFT /10x	$8300

NEC

2430CD • P133/16M/1.0G/6x/11.3" DTN	$3600
4200 • P100/8M/810M/10.4" TFT	$3500
4230 • P133/8M/1.0G/6x/10.4" TFT	$4100
6030H • P133/16M/1.3G/6x/11.3" TFT	$5376
6030X • P133/16M/1.0G/6x/12.1" TFT	$5660
6050MH • P150/16M/1.4G/10x/12.1" TFT	$6700
6050MX • P150/16M/2.1G/10x/12.1" TFT	$7360

IBM ThinkPad

365XD • P100/8M/1.08G/11.3" DSTN/ 4x	$2600
365XD • P133/16M/1.36G/11.3"TFT/ 6x	$3800
760ED • P133/16M/2.1G/12.1"TFT/6x	$5200
760EL • P133/16M/1.08G/12.1" TFT	$6000
760EL • P133/32M/2.1G/12.1"TFT	$6700
760E • P150/16M/2.1G/12.1"TFT	$7690

SCEPTRE

S3900 • P120/8M/810M/10.4" DSNT	$2220
S3900 • P133/16M/1.0G/11.3" DSNT	$2360
4000D • P133/16M/1.3G/6x/12.1" TFT	$3680
4000D • P150/40M/1.3G/6x/12.1" TFT	$4800

FIC

LEO 3600 • P133/16M/1.3G/10x/12.1" TFT	$3800

Deewoo

P133-16M/ 1.4G/ 6x / 12.1" TFT	$3680

Notebook Accessories

- Notebook Memory
8MB +$110.00
16MB +$200.00
- Modems
Megahertz XJ3336T 33.6 modem + 10BT $410
Megahertz CC4336 33.6 pcmcia modem $315
Megahertz XJ4336 33.6 X-Jack modem $320
33.6 Pcmcia faxmodem $200
- Ethernet Cards
3Com 3C589C-TP PCMCIA $180
3Com 3C562B comb + 28.8 modem $370
3Com 3C562C-TP w/33.6 modem $410
Xircom 33.6 & TP $400
- Batteries Sound Cards Backup
(Call For Pricing)

All listed prices, quantities and specafacations are subject to changed without notice.

Microsoft OEM dealer

USRobotics

Sportster 33.6k Voice int.	$138
Sportster 33.6k Voice ext.	$200
Sportster 56k int	$230
Sportster 56k ext.	$250
USR (56k) upgrade kit	$110

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Intel ATX Marl 2 512k USB MMX	$165
Intel ATX Tucson 512k SB16 MMX	$255
Intel ATX Venus P6	$260
Intel ATX PRO Dual P6 UWscsi	$710
Tyan Dual P5 /512k AT	$330
Tyan Dual P6 AT / ATX	$430/460
Asus TX97 512k .AT/ATX	$240/318
Asus HX 512 MMX AT/ ATX	$185/195
G4 HX512 MMX AT	$165
T2 512k MMX AT	$118

HARD DRIVES

Quantum Seagate

1.0 / 1.2 /1.7G	$215/225/250
2.8 / 2.5	$260/300
Quantum 1.2 / 2.1G	$250/285
Quantum 2.5 / 3.2G	$310/360
Quantum 3.8 / 6.4G	$400/530
WD 1.2 /1.6 /2.1	$250/270/295
WD 2.5 /3.1 /4.0	$330/375/475
Seagate Matelist 2.5	$330
Quantum 2.1/ 3.2 scsi	$400/560
Quantum 4.5G UW scsi	$1190
Quantum 9.0G UW scsi	$2200
Seagate4.3/9 UW scsi.	$1200/2480

MULTIMEDIA

Sound Card

16bit sound card	$30
SoundBlaster 16 / ide	$65/73
SoundBlaster 32pnp	$110
AWE64 pnp(512k)	$245
AWE64 Gold (4MB)	$300

CD-ROM

8x /12x eide	$110/130
16x /18x eide	$165/220
12x /16x scsi	$230/280
16x Tone scsi	$360

CD-WRITER

Panasonic 4x2x	$510
Panasonic 4x2x /ctrl/sft	$580
Creative 4020i /ctrl/sft	$580
HP 6020i/e	$590/730
writable cd-disk	$8
video cd (fashion music)	$8

Speakers

0W/80W/160W	$20/22/50
Yamaha M15	$95
Yamaha Subwoofer MT10	$135

CPU

intel. AMD

Intel P5 100/120/133	$140/145/180
Intel P5 150/166/200	$210/350/620
Intel P5 MMX166/200	$455/698
Intel P6 150/180/200	$250/620/710
Intel *PentiumII-233/266*	$1150/1250
Intel Pentium *Pro 200/512k*	$1450
AMD K5 75/90/100	$46/60/65
AMD K5 120/133/166	$98/100/180
AMD K6 MMX166 / 200	$350/480
IBM 6x86 150/166/200	$130/170/265

VIDEO CARDS

ATI DIAMOND

CL 5440 1M / 2M	$35 /50
CL 5446 1M / 2M /4M	$45/60/70
S3 Trio 64 ..1M /2M	$38 /52
S3 Virge 3D 2M /4M	$75 /100
ATI mach 64 1M /2M	$60/80
ATI 3D 2M / 4M	$140/180
ATI 3D PC2TV 2M/4M	$165/205
ATI ProTurbo PC2TV 4/8	$255/395
ATI all-inWonder 2/4M	$335/365
Mystique 2/4M (retail)	$155/200
Millennium 2/4M(retail)	$230/330
Monster 3D 4M retail	$350

SCANNERS

HP 5P / 4C	$520/1110
Microtek E3/E6	$290/650
Microtek E6.30/ 3.	$870/1980
Epson ES1200C/Pro.	$990/1280
UMAX powerlook2000.	$4650
Relisys Infinity 30bit CCD	$5

ZIP / TAPES

HP T1000 / E (900M)	$160/200
HP T2000 / E (2G)	$220/260
HP T3000 / E (3.2G)	$250/330
HP T5000 / E (4 G)	$450/500
Ditto 2G Traven i/e	$200/250
ZIP 100M Para/scsi I/E	$196
JAZ 1G scsi Int/ Ext.	$500/605
Zip disk / Jaz disk	$18/115
Traven TR1/TR3/TR4	$36/39/55

CAMERA/CAPTURE

Miro DC30	$1380
Casio	$200
Kodak DC50	$950
Sharp	$275
USR Video Fax	$300
Asenp RPT3	$350

RAM

EDO/Reg

72pin 4 / 8 / 16M	$32/58/112
72pin 32 / 64M	$225/598
72pin Parity 4 / 8 /16M	$45/80/134
72pin Parity 32 / 64M	$255/580
30pin 1M / 4M	$12 / 32
DIMM 16 / 32M	$120/235
DIMM 64 / 128M	$485/1250
SDRAM (10ns) 16 / 32M	$115/230
ECC DIMM 32 / 64M	$225 /570
ECC DIMM 128M	$1460
SOJ Video RAM 1M	$15

MONITORS

SVGA 14"/15"/17"	$225/310/550
Acer 15"/17"	$360/800
MAG DX15T /D700T	$450/790
NEC C500/M500.	$450/515
NEC XV15+/XV17+	$610/950
NEC M700/P750	$1020/1130
Sony 100SX/SF	$520/610
Sony 200SX/SF	$920/1090
Sony 17SE2T/20SE2	$1350/2560
Samsung 15Gle/Gli	$430/470
Samsung 17 Gli/Glsi	$820/980
ViewSonic15GS/17GS	$450/800
Viewsonic 17PS/PT770	$930/1020
Viewsonic P810/815	$1950/2490
Optiquest V665/V775.	$690/780

PRINTERS

HEWLETT PACKARD

HP DJ 400C/692C	$250/400
HP DJ 820cxi/870c	$490/650
HP 5L / 6P /6MP	$530/960/1260
HP 5 /5N /5M	$1680/2080/2455
HP 5M Color w/32M	$9900
HP 4V /5Si	$2580/3650

Canon

Canon BJC240/4100	$239/305
Canon BJC4200/4550	$325/590

Brother

Brother HL730DX 660	$495
Brother HL760DX 1200	$600
Brother HL1280	$1100

Epson

Stylus 400 (720dpi)	$340
Stylus 600 (1440dpi)	$426
Stylus 800 (1440dpi)	$590

Lexmark

Inkjet 2050	$320
Optra N 4/16M	$3080/4920
Optra Lx N+/Net.	$3290/3500

Pentium Systems AT

Intel P5--120/133......$970/995
Intel P5--150/156..$1060/1180
Intel P5--200mhz.........$1460

Intel VXpro 512k Eide 2S,1P MMX support
16M EDO 72pin 60ns
FD 1.44 1.2GB eide HD Mode 4
PCI 1MB SVGA w/MPEG
14" SVGA Monitor color
13" Tower case w/power
104 win95 keyboard
3 button mouse w/pad

MMX Systems ATX

Intel P5 MMX 166........$1695
Intel P5 MMX 200........$1940
AMD K6 MMX 166.......$1590
AMD K6 MMX 200.......$1720

Intel HX Marl2 512k Eide 2S 1P
32M EDO 72pin 60ns
FD 1.44 2.0GB eide HD Mode 4
PCI S3 3D 2MB SVGA w/MPEG
15" SVGA Monitor color
17" ATX Tower case w/ATX power
104 win95 keyboard
3 button mouse w/pad
(12x cd rom eide +$125)
(16 bit sound card +$30)
(33.6 Voice FaxModem +$90)
(80W speakers +$18)

Dual Pro Systems

Tyan Dual P6 systems
Tyan Dual P6 ATX systems
Asus Dual P6 systems
Intel Dual P6 systems

NETWORKS

• 16bit isa comb Ethernet	$35
32bit pci comb Ethernet	$60
Intel PCI Pro 10+	$99
Intel PCI Pro 100	$140
3COM PCI 3C900 comb	$125
3COM PCI 3C905 100B	$125
BNC/Terminator/T	$3
Coaxl 10ft/20ft/50ft	$15/20/35
Hub 8port /16port	$95/190
• Novell Users 5 / 10	$900/1500
NT 4.0 Server 5 /10	$890/1100
NT Wkstn 4.0 / license	$280/80
• UPS 280/450/600	$155/206/340
UPS Smart.800/1000	$370/550

Controller / CASE

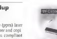
SCSI 1520 /1522	$90/96
PCI SCSI 1535/2920	$135/195
PCI SCSI 2940 /2940UW	$240/285
PCI 3980 2-chanel scsi	$680
Scsi cable/ Wide scsi cable	$10/26

Mouse/Logitech 2B	$8/18
Logitech 3B /MS V2.1A	$32
AT13/15/19/23"	$48/53/65/100
ATX 17 /23"	$95/120
104KB/Fujitsu8725/4725	$20/30/60
MS Natural /TouchPad KB	$88/75

Multi-function roundup

Continued from page 65

600x600 dpi 6 pages per minute (ppm) laser engine which serves as your printer and copier. The scanner is 400x400 Twain compliant and as usual, the PC fax is in there too. Most appreciated is the software bundle called Multi-function Link PRO which includes a simple to use viewer/editor and drag-and-drop document management.



The top of the line comes in next with the MFC 6550MC which again adds message centre features to your PC. This time, however, it integrates with your hard drive for unlimited storage as well as fax on demand capability. In addition, that extra $250 gets you 600x600 dpi (interpolated) scanning and copying along with the Xerox TextBridge OCR software and something called Binary File Transfer software, which allows you to send any file as a high resolution fax.

Brother has also thoughtfully included an instructional video to get you up and running with a minimum of frustration.

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♥Integ. Intel Pro 10/100B Network Card
♥Integ. Adaptec 7880 UW SCSI Cont.
♥Integ. Crystal/Yamaha 16-bit Sound Card
♥MS NT Server 4 0 w/5 Licenses
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*Intel PPro CPU Comes w/256K Cache

In Stock

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♣Intel Pentium Pro w/200Mhz CPU
♣32MB EDO DRAM Memory
♣2.1GB Fast DMA2 EIDE Drive, 10ms
♣12X EIDE CD-ROM
♣1 44MB FDD
♣ATI Mach 64 Video w/2MB VRAM
♣ATX Tower Case w/250Watt PS
♣Keytronic 104 PS/2 Keyboard
♣Logitech PS/2 3Button Mouse w/Pad
♣Intel Pro 10/100B PCI Network Card
♣MS Windows NT Workstation 4.0
$2795.00
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♠1 7GB Fast DMA2 EIDE Drive, 10ms
♠1 44MB Floppy Drive
♠12X EIDE CD ROM
♠S3 V+ 64-Bit Video w/2MB EDO DRAM
♠Kerrie AT Mid-Tower w/250Watt PS
♠SB 16bit Sound Card
♠60Watt Powered Speakers
♠Keytronic 104 Keyboard
♠Logitech 3Button Mouse w/Pad
♠Intel Pro 10/100B PCI Network Card
♠MS Windows NT Workstation 4.0
$2240.00

NOTEBOOKS:
TOSHIBA 430CDT $3,695.00
P120Mhz, 16MB RAM, 1.26G HD, 6X CD-ROM
IBM ThinkPad 365XD $3,795.00
P133, 16MB RAM, 1.35G HD, 6X CD-ROM

HP Desktops:
HP Vectra XM4/133 $1,550.00
16MB RAM, 1.26G HDD, HP Network Integrated
Monthly rental:
Rent HP Vectra XM4/133 $150.00

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PHONE: (604) 737-7483 Fax: (604) 737-7417

Hewlett-Packard
Models: OfficeJet 350, 500 series
and OfficeJet Pro 1150C
From: Hewlett Packard Canada
Estimated street prices: $799 (the 350), US$500 (500 series), $1 499 (1150C). Note: H-P does not release estimated street prices.

Hewlett Packard has long been known as the purveyor of very good inkjet printers so it's no surprise that its MFPs are based around that technology. Like Brother, it has recently attacked the MFP market with a vengeance, introducing no less than six new machines this year which, added to the two already available, brings the total to eight.

We begin with the 300 models, two machines based on a black-only printer engine. The OfficeJet 300, however, doesn't qualify as a true MFP because it lacks a built-in scanner so the OfficeJet 350 is the only one of the pair that we'll look at here.

It's a rather fancy though largish machine with easily accessed and understood controls. The printer is capable of 600x300 dpi and prints at up to 3 ppm while the 300 dpi scanner is capable of 32 shades of grey. Paper feed is from a 100-page front-mounted tray to a delivery bay just above it on the front. Curiously, these are the same awkward mechanicals found on many older Hewlett-Packard inkjet printers—and the only aspect of H-P printers, in my experience, to fail.

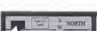
The software bundle is equally modest in providing basic tools for operating all of the machine's elements (printer, scanner, fax, etc.) but at least they've thrown in Caere's OmniPage OCR, albeit in a stripped-down, limited edition.

Hewlett Packard doesn't want to highlight the 300 series machines though, as they've newly introduced six MFPs in the United States with updated and upgraded abilities.

Five of these six machines lie within what has been dubbed the 500 series (500, 520, 570, 580 and 590), with the remaining Pro 1150C standing on its own. It should be made clear, though, that none of the 500 series will be available in Canada until the end of 1997. You can currently choose between the OfficeJet 300 and 350 and the newer Pro 1150C. However I've included all Hewlett-Packard models here in the survey so you can better make the decision as to whether to wait for the arrival of the 500 series or not.

It's with the 500s that the bulk of the consumer market will eventually be wooed. All models in the series share rather more in common than in distinction. The are all modestly proportioned in the fashion of the competition with the simplified controls sitting comfortably at the right side of the machine. Paper feed from the 20-page bin as well as the single-sheet feed are from back to front. All employ a 4 ppm (black)/1 ppm (color) inkjet printer and monochrome TWAIN-compliant scanner. The copying resolution is 600x300 dpi for all, and each has a 14.4Kbps faxmo-

Continued on page 70



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Panasonic 1.44M Floppy Drive
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104 Key win95 Keyboard
Addax 13" Tower Case w/230w PS
3 Button Mouse & Pad

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Mitsumi 6x CD-ROM	Microphone
16 bit PnP Sound Card	60W Speakers

SUPER DEAL

Cyrix 6x86 P150+	$1568
Cyrix 6x86 P166+	$1608
Cyrix 6x86 P200+	$1718

Triton III PCI MB, **512K** Pipeline Cache
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32MB EDO RAM
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2.1GB EIDE Hard Drive
Panasonic 1.44MB Floppy Drive
S3 3D 64bit 2M (exp 4M) MPEG Video
15" Acula NI/LR/Digital/Flat Monitor
Zoltrix 33.6 Voice Fax Modem
Yamaha 3D Surround PnP Sound Card
Mitsumi 104Key Win 95 Keyboard
Mitsumi Mouse & Pad
Addax 19" Case w/230w PS
60W Amplified Speakers

POWER SYSTEMS

Pentium CPU:	
P 100/120/133	$855/869/915
P150/166/200	$959/1119/1379
MMX P166/P200	$1269/1539
PRO 150/180/200	$1239/1629/1739
Cyrix/IBM 6x86 CPU	
P150+/P166+/P200+	$869/919/1029
AMD CPU	
K5-75/90	$799/819

Intel Triton Chipset 256K PL Cache
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Mitsumi 104Key Win95 Keyboard
Mitsumi Mouse & Pad
Addax 13" Tower Case w/230W PS

MULTIMEDIA SYSTEMS

Pentium CPU	
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Intel P150/P166/200	$1439/1599/1859
MMX P166/P200	$1749/2009
PRO 150/180/200	$1729/2109/2219
Cyrix/IBM 6x86 CPU	
P150+/P166+/P200+	$1349/1399/1499
AMD K5-75/90	$1279/1289

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- 33.6 V34 voice Fax/modem
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- 8xCD-ROM EIDE
- 1.44 Floppy Drive
- Mouse & Pad

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PCI VIDEO CARDS

Trident 9680 64bit MPEG	$42
Cirrus Logic 5446 1m MPEG	42
Cirrus Logic 64bit 1M MPEG	26
S3 3D Virge MPEG 4M	85
S3 3D MPEG 2M (Exp to 4M)	71
Diamond Stealth 3D 2M	129
ATI 3D Expression 2M	115
ATI 3D +PC2TV 2M SDRAM	159
ATI 3D +PC2TV 4M SDRAM	199
Trident 1685 3D PC2TV	82
Matrox Millennium 2M/4M W	259/339
Matrox Mystique 2M/4M SG	175/218
STB Velocity 4M VRAM	215
STB Lightspeed 128 bit 2M MDRAM	149
Video Card EDO RAM 1M	15

MONITORS

14' KTX NI/LR	$224
14' ACULA NI/LR	225
15' Meg image NI/LR/Dig./Flat	329
15' KTX NI/LR/Digital/Flat	329
15' ACULA NI/LR/Dig?OSD/Flat	329
15' Sceptre NI/LR/Dig./Flat	349
17" Sceptre J73 Multimedia DSD	699
17' Sceptre NI/LR/dig./Flat/OSD	649
17" Acula NI/LR/Dig./Flat/OSD	609
17' KTX NI/LR/Dig./Flat/OSD	609
Samsung 15" GLE	465
Samsung 15" GLI	495
Samsung 17" GLI	849
Samsung 17" Glsi	1019
MAG DX1795E 28DP	755
MAG DX1795 26DP	635
MAG DX700T 25DP	699
ViewSonic Optiquest V773	735
ViewSonic 17' PT 770	998
ViewSonic 17' GT 770	925
ViewSonic 17" GS/PS	795/945

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Pentium Triton III PCI MB MMX 4EIDE 1P/2 x 16550 256K PL Cache	$115
Tayan Tomcat III Dual P5/512k	325
ASUS T2P4 HX 256K PL MMX	167
ASUS VX97 256K PL MMX	148
586/486 PCI/VLB/ISA MB Fast I/O 4EIDE 1P/2x16550 4x72pin	85
GA-5MS ATX 256PBC 8 512MB	165
GA-6FX Pentium Pro 512K PBC 8 512MB	299
GA-6DX P-Pro Dual CPU 512K PBC	549

PRINTERS

Canon BJC240 Color Printer	$224
Canon BJC4100 Color Printer	299
Canon LBP 460 Laser	339
Panasonic KX-P6500 300 dpi 6PPM	459
Brother HL7300X true 600DPI 6PPM	434
Brother HL7600X true 1200DPI 6PPM	544
Bro HL1660 True1200DPI 17PPM	1385
Bro IC-100 Scanner 400 dpi	89
Bro IC-150 Scanner 400 dpi OCR	109

TOWER CASES

13"/15" Tower Case w/230wPS	$46/52
17"/19' Tower Case w/230w PS	57/65
ATX Desktop Case w/PS	105
ATX 19' Tower Case W/PS	125
Full Size Tower Case w/250W PS	89

FAX/MODEMS

Zoltrix 33.6 Fax/Modem	$94
Zoltrix 33.6 Voice Fax/Modem	99
Acer 33.6 Voice Fax/Modem	99
Appachi 33.6 Voice Fax/Modem	99
USR 33.6 win Fax/Modem	125
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Multi-function roundup

Continued from page **68**

dem and share the ability to enlarge and reduce images within the copying function from 50 to 200 percent.

The relatively practical software bundle includes Corel's Print & Photo House Select, Mycolor Marketing Materials The Student Writing Centre and SoftKey's Key Form Designer and Calendar Creator They also throw in a "try-before-you buy" version of OmniPage Pro, a document-management package.

OfficeJet 1150C

Where the differences between machines lie is between all those common features. Depending on which model you choose, you'll be able to scan at 300 dpi or 600 dpi (enhanced) acquire a fax memory of 35 to 65 pages and program the machine for 40 to 100 speed-dial numbers.

At the very top of the Hewlett-Packard heap lies its flagship OfficeJet Pro 1150C a somewhat ponderously proportioned desktop device that is capable of equally impressive performance—the "Pro" in this case is more than mere marketing nomenclature.

The first and most notable characteristic of this very nice machine is that it incorporates a true flat bed scanner the only MFP in this survey to do so. The second very happy circumstance is that the scanner is also color capable. Rather toward the more unhappy end of things however, is that Hewlett Packard has elected to omit a faxmodem—a blank for which I could get no explanation.

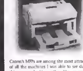
But back to what the 1150C does do and does do well. Curiously paper feed is from a 180-page front-mounted tray that's based on the same iffy mechanism employed in older H P printers and in the 300 series MFPs. The printer itself is capable of printing at 8 ppm in black and half that in color and will copy monochrome documents through the incredible 1 200 dpi 24-bit scanner at a whopping seven copies per minute (cpm). Color takes about 3 cpm. Unfortunately though the 1150C won't produce at that high resolution. However, the 600x300 dpi of the printer will satisfy most output requirements. And, just to cement the upper class nature of what they're offering here, Hewlett Packard has loaded 125 TrueType fonts directly into the 1150C's chip set.

Other perks are incorporated into the software bundle, which includes Hewlett Packard's standard ColorSmart software (to optimize color printing) as well as something called CopySmart to let you do all kinds of things with the scanner/copier function (like alter the dimensions between 50 and 400 percent). ScanSmart lets you add images to any 32-bit applications quite simply (though I didn't test the stated theoreticals, Hewlett Packard says ScanSmart can put an image into a 32-bit application with three mouse clicks while, without it you'd need 18 mouse clicks and the launching of two applications to achieve the same results).

The rest of the bundle is made up of Adobe's PhotoDeluxe image editing and managing software and Caere OmniPage LE OCR. All in all this is an extremely high-quality and fine machine with only the lack of a fax modem and that anachronistic Rube Goldberg paper-handling system counting against it. A serious machine for serious MFPers with what we can only suppose will have to be serious wallets.

Canon

Models: MultiPASS 800, MultiPASS C2500
From: Canon Canada
Estimated street price: n/a (MultiPASS 800)
$845 (MultiPASS C2500)


MultiPASS C250C

Canon's MFPs are among the most attractive of all the machines I was able to see during this survey looking rather like overgrown

Continued on page **72**

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Multi-function roundup

Continued from page 70

standalone faxes and so very good at conserving that all too rare desk space

Both these machines immediately struck me as ultimately wantable though the 800 would only be of interest to those with minimal requirements The simple control panel that surrounds their LCD displays is easy to figure out and their "fax machine" shape means they'll sit comfortably on most desks. Document feed and paper feed are both straight path back-to-front with little chance of a screw up

The 800 is based around Canon's own very popular monochrome inkjet engine, which offers up 360x360 dpi resolution at 2 ppm for both printing and copying The 64 grey scale fax is alas a more than disappointing 9 6Kbps model that may prove ultimately frustrating However, it does have a 47 page memory with a one-hour battery backup that partially makes up for its appalling lack of speed. The PC fax function is relatively straightforward while the scanner manages a reasonable 200 dpi The MultiPASS 800 comes bundled only with one software application called Desktop Manager, which acts as a control centre for the five functions of the machine.

The C2500 differs greatly in that, as the name might indicate, it's based on Canon's popular BJC-4100 color inkjet printer engine Here we have true four-color printing at resolutions up to 720x360 dpi on a variety of media including T shirts! The fax is a much more satisfying 14 4Kbps with 42 pages of memory and that same one-hour battery backup The PC fax is quite simply an extension of that and the 200 dpi scanner is the same as that in the 800 model

The C2500 comes with slightly more software than the 800 The bundle includes Canon's own Creative CD ROM which is full of utilities, in addition to Desktop Manager v1 4

Xerox

Model Document WorkCenter 250
From XEROX Canada Ltd

XEROX will be introducing a couple of new MFPs in 1997 but does not want to reveal any information about them prematurely (read in this survey) Its Document WorkCenter 250 of last year was a very practical and economical MFP that included the impressive TextBridge OCR package So those with a loyalty to or a hankering for a Xerox product may wish to wait until the new models are announced sometime late this summer or contact Xerox directly for more information

Lumina

Models Lumina 2096 and 2144 Enhanced
From Lumina Office Products
Estimated street price US$299 or approx. $400 (2096) US$349 or approx $525 (2144)

How you might well ask can Lumina sell true MFPs for these low prices when everybody else wants so very much more? The rejoinder, however says less about covert corporate cartels than good ol American ingenuity The Lumina people reasonably reasoned, you see, that most computer owners already have a printer Chances are they've already been through the ringer of studying and reading and shopping and comparing to arrive at a choice that best suits their needs Why then—those canny Lumina people asked themselves—should we make them purchase a second printer?

That approach made the Lumina a unique MFP product when it was introduced in February of 1996 Lumina's unit is smaller,

lighter and cheaper than any of the other true MFPs because it's wired up to perform all the printing functions using your existing printer unit—as long as you have one of the more popular models of inkjet or laser printers (dot matrix aficionados are out of the running here)

That being the only real difference from other MFPs, the Lumina is a fully featured plain paper fax machine faxmodem, scanner and copier that connects to your computer through the parallel and serial ports just like any other.

Optimizing the desk-saving advantages of an MFP the Lumina is deceptively small and light with a simple control panel traversing the entire top/front panel. To the left of centre under a hinged panel lies the 33 key Alpha section, which contains a few specialty buttons along with all the letters of the alphabet for typing in your phone book and stuff To the right of the machine lies the Function section of seven one-touch keys for things like Copy Redial, Start Stop etc. Between those panels lies the two-line LCD above a standard telephone keypad which Lumina calls the Numeric Key section.

Along the back panel is where you'll find the usual telephone and parallel and serial hook ups as well as the additional connector for your printer cable Alas, it's at the back too that you'll find the power switch

Ignoring that iniquitous physical flaw the raised buttons on all three control panels are well spaced and evoke a variance of "beeps" to reassuringly acknowledge prestidigital success And lacking a printer engine, paper handling is through a single slot from the 30-sheet paper bin straight through to the front of the machine in a fashion identical to a standard, standalone fax (all other paper handling is dependent on your own printer).

My Lumina came bundled with Phoenix's Eclipse Fax software and a single diskette control package for controlling various tasks through your computer. The press kit I received discussed the addition of an OCR package from Phoenix as well as the electronic file management application called Documagix PaperMaster SE. Which is where the enhanced designation now comes in for the 2144 as an added "enhancement" Lumina 2144s include an Internet Fax package that's Windows 95 and Windows 3 1x compatible and will allow you to send documents and attached files as email.

Documentation wise the user's guide for the Lumina is unintimidating in size and has been recently revamped to simplify what was once written in nearly incomprehensible computerese Manuals for the software are relatively easy to work through for anyone with

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Multi-function roundup

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at least some experience with various applications

The specifications for the Lumina remain respectable if not overwhelming. The standard 2096 version comes with an appalling 9.6Kbps modem that has an eight page memory. The 2144 model differs only in being equipped with an at least useable 14.4Kbps modem and 60-page memory. The scanner is a CCD type capable of 408x392 dpi resolution that, through dithering and other software type manipulations, emulates 32-bit/264-grey scale while the copier function lets you scale your copy size from 25 to 250 percent of the original. The only options available are 1 MB and 4 MB memory upgrades plus a handset to let you get your phone off the desk too.

Overall, the Lumina Series 2000 MFPs are well enough built and excellently conceived though I'm not at all enamored with that all-too-common-in-MFPs 9.6Kbps fax. But price-wise, you certainly can't lose here... unless you're unhappy with your current printer and were planning to get a new one.

In addition to the price reduction and inclusion of OCR, document-management and Internet fax software packages, another new development for this product is that it's now much more readily available from retailers—the rather obscure Lumina company has struck deals with a number of office superstores and regional distributors. Anyone who had difficulty tracking down the Luminas after they first hit the scene will no longer have that headache.

Panasonic
Model: KX-PS600
Estimated street price: $799

KX-PS600

At the time I originally spoke to Panasonic, its KX-PS600 was absolutely the rarest MFP in America. I had lengthy conversations with several Panasonic reps to determine that there was only one in existence back then and that it was doing the rounds between engineers before a final send-off to mass production. That means I never got to see it. I saw a picture, drafts of the press release and spec sheet so I was at least able to get an idea of what was to be soon on the market. Well, several months later the KX-PS600 is now in production and shipping in plentiful quantities but I still, somehow, haven't ever actually seen one.

So, based again on conversations with Panasonic representatives, here is what the machine is supposed to do:

The most notable thing about this MFP is that it's designed around a small footprint mini-tower type case. Unfortunately though, that space-saving vertical thrust is defeated by the fact that the three paper trays (input tray, feed to scanner and a 100-sheet hopper) all stick out about a foot to the right from the top and bottom of the side panel and top again of the top panel. This mean it ain't as slim as it could have been, desktop wise.

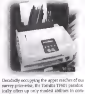
The second most notable thing is that, like a few others in this survey, the makers have elected to leave out a faxmodem—the KX-PS is essentially a scanner and printer in one but makes use of your existing faxmodem card to perform all the rest of the MFP functions.

But Panasonic isn't trying to fool us entirely about that lack. They've designated the KX-PS600 as a "Personal Image Editing System" instead of as an MFP. Applying a logical derivative of Lumina's reasoning, they contend that most people will already have a faxmodem so there's no reason to make them buy another.

According to the company news release, the KX-PS600 will offer 300 dpi, 64 grey-scale scanning at 5 ppm to a laser engine running at 6 ppm that can print and copy at up to 600x600 dpi. The copier function will make quick, exact copies without involving the computer, or, through software, you'll be able to reduce, enlarge and multiply. The basic model will be equipped with 512KB of memory that will be upgradable to 4.5 MB.

Included in the proprietary software bundle is drag-and-drop client software for linking captured images to email and faxes along with other utilities including a basic image archival and retrieval database for personal image management. According to the MFP Report, these packages were developed by the "U.S. branch of Taiwan's Destiny Technology Corporation in conjunction with KME, Panasonic's Japanese parent." As a very nice bonus—and like so many others now—Xerox's excellent TextBridge OCR software is included as well.

Toshiba
Model: TF601
From: Toshiba Canada Ltd.
Estimated street price: $1,400 to $1,500



TF 121

Decidedly occupying the upper reaches of our survey price-wise, the Toshiba TF601 paradoxically offers up only modest abilities in comparison to many of the other MFPs in this survey. However, with the use of Toshiba's proprietary ImageVision IV software package, the TF601 is a capable machine albeit a somewhat expensive vestibule into lower-end laser engine-based products.

Like the Canon products, Toshiba has stayed with the comfortable and familiar overall "look" of a regular—though slightly

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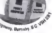

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Intel Pentium® Pro 150MHz/180MHz/200MHz	$399/710/842
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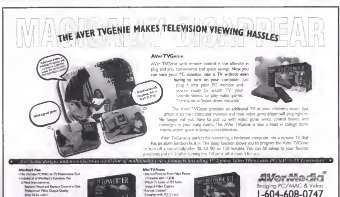
Pentium® 200MHz/200MHz MMX	$699/823

*Based on lease of 36 months. Prices subject to change without notice. All prices are cash prices. Pentium is a registered trademark of Intel Corporation.

Multi-function peripheral survey

Product	Print technology	Color	Maximum print res.	Maximum scan res. (dpi)	Grey levels	Print speed (ppm	Fax speed (Kbps)	OCR software included?
Brother								
MFC690	Thermal fax	no	200x400	400*	64	2 (est.)	9.6	no
MFC890MC	Thermal fax	no	200x400	400*	64	2 (est.)	14.4	no
MFC1750	Inkjet	no	200x400	400*	64	2 (est.)	14.4	no
MFC1950Plus	Inkjet	no	200x400	400*	64	2 (est.)	14.4	no
MFC4550	Laser	no	600x600	400*	64	6	14.4	no
MFC6550MC	Laser	no	600x600	400*	64	6	14.4	yes
Canon								
MultiPASS 600	Inkjet	no	360x360	[illegible]	64	[illegible]	[illegible]	[illegible]
MultiPASS C2500	Inkjet	yes	720x360	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hewlett Packard								
OfficeJet 350	Inkjet	no	600x300	300*	32	3	9.6	yes
OfficeJet 500, 520	Inkjet	yes	600x600**	300	64	4***	14.4	no
OfficeJet 570, 580, 590	Inkjet	yes	600x600**	600	64	4***	14.4	no
OfficeJet Pro 1150C	Inkjet	yes	600x600**	1,200	n/a	8****	n/a	yes
Lumina								
2096	User	User	User	408x392	264	User	[illegible]	yes
2144	User	User	User	408x[illegible]	264	User	14.4	[illegible]
Okidata								
OKIOFFICE 44	Toner	no	600x600	200x400	16	4	14.4	yes
Panasonic								
KX-P5600	Laser	[illegible]	[illegible]	[illegible]	64	[illegible]	[illegible]	[illegible]
Toshiba								
TF601	Laser	no	300x300	200x400	64	4	9.6	yes
TF 421	Thermal	no	200x400	200x400	64	4	9.6	yes
TF 461	Inkjet	yes	600x300	200x400	64	3	9.6	yes
Xerox								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Notes:
User: works with the printer or fax card you own * Scan rate is interpolated ** Color resolution is 600x300 *** Color print speed is 1 ppm **** Color print speed is 4 ppm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THE AVER TVGENIE MAKES TELEVISION VIEWING HASSLES
"I don't care if Mom is watching TV upstairs and you're up to 1,000,000 points, I'M WATCHING THE FOOTBALL GAME!"
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TV CONVERTER
VIDEO PHONE KIT

AVer TVGenie

AVer TVGenie with remote control is the ultimate in plug and play convenience and space saving. Now you can turn your PC monitor into a TV without even having to turn on your computer. Just plug it into your PC monitor and you're ready to watch TV, your favorite videos, or play video games. There is no software driver required.

The AVer TVGenie provides an additional TV in your children's room. Just attach it to their computer monitor and their video game player will plug right in. No longer will you have to put up with video game wires, control boxes, and cartridges in your living room. The AVer TVGenie is also a must in college dorm rooms where space is always a consideration.

AVer TVGenie is perfect for converting a bedroom computer into a remote TV that has an alarm function built in. The sleep function allows you to program the AVer TVGenie to turn off automatically after 30, 60, 90, or 120 minutes. You can fall asleep to your favorite programs and no bother turning the TVGenie off, it does it for you.

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overgrown—fax machine despite the fact that this is a laser engine based machine The design works well however in keeping footprint to a minimum and having an overall attractive appearance

As a relative newcomer to the MFP game it is surprising Toshiba has elected to fall in with older machines in employing an abysmally anachronistic 9 6Kbps faxmodem ver the eminently more useful 14 4Kbps onsidering the price it's a wonder too that he laser engine has a maximum resolution of nly 300x300 dpi (when used with the mageVision software and specific to Vindows applications) Though it is capable t fairly rapid output at 4 ppm

Scanning resolution is equally modest at 00x400 dpi (interpolated) through the mageVision IV software More toward the lus side however Toshiba is a well-established and well respected manufacturer nsuring quality of construction and operation

That said 9 6Kbps fax speed amounts to bout nine seconds per page while the 64 ey scale scanner when set for Rapid Scan ill reach as high as a blazing five seconds per age if the image isn't too complex The TF601 comes equipped with 256KB of page emory (that's about 20 pages) but can be pgraded to 2 25 MB (144 pages) if required ther features include a 160-sheet paper bin nd a 20 sheet document feeder for the ax/scanner/copier (this is protractedly cronymed by Toshiba as the ADF, for automatic document feeder, so don't be confused y that if you ever take the time to read a rochure)

The necessary ImageVision IV software sed to be sold separately for more than $200 n the U S but now that it's bundled free in anada anyone who buys the TF601 can take dvantage of what it has to offer ImageVision V is a document management package and mage-editing utility as well as control centre or the background operation of the TF601's eatures There are also telephony features for old call waiting and call display compatibility plus you can add an external answering machine to a create "a virtual communications centre" out of your MFP As well ImageVision IV incorporates Caere's popular WordScan OCR package

Toshiba has developed the ImageVision IV package into a flexible, practical and intuitive tool. It is a recent upgrade of not surprisingly its ImageVision package so there are several refinements and extra features

As a footnote Toshiba announced two more consumer priced MFPs just before deadline the TF 421 for about $695 and the TF 461 likely to sell for around $795

Okidata
Model OKIOFFICE 44
From Okidata Canada
Estimated street price $1 100 to $1 200

This is a new entry into the MFP market from the venerable Okidata corporation so new in fact that it won't be shipping until just about the time you're reading this What that means is it's another machine that I never actually got to see

According to Okidata this "toner based" (a kind of LED technology that employs dry ink powder instead of wet ink—ie it works similarly to but not the same as, a laser printer) machine is capable of printing copying, faxing and scanning And for those of you frightened by the non-standard technology, refills for the toner come in proprietary cartridges just like for a laser printer

The rest of the machine features a 100-sheet paper bin and a fax with 21 pages worth of memory and 55 numbers worth of speed dial memory The OKIOFFICE 44 will be shipping with a software bundle called Jetsuite—the usual management control and utility package for all of the machine's abilities—along with Caere's WordScan OCR application

It's not possible to evaluate a machine like this without actually seeing it but Okidata has made consistently capable and well-built products for a long time so we can at least trust that the OKIOFFICE 44 will share that heritage It likely deserves at least a look see before you commit to purchasing any other machine ❏

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Compton's launches Home Library series

Six titles and bonus discs range from odd to interesting

BY JEAN ALLEN-IKESON

Compton's NewMedia Inc, a division of The Learning Co, has released several new CD ROMs in what it is calling Compton's Home Library. The Home Library releases include six titles, each of which would be a good addition to your reference case. To sweeten the deal, Compton's has thrown in an extra CD ROM on a related topic with each of the Home Library titles.

While these new releases are on seemingly unrelated topics, one would expect that over the next few years, new titles will help fill in the gaps to create a core of essential home reference products.

Interactive Encyclopedia

Estimated street price: $55 to $60

Probably the best known of the Home Library titles is Compton's 1997 Interactive Encyclopedia. The bonus disc with this title is the Time Magazine Multimedia Almanac. Yes, I groaned too: a Macleans Almanac might be more useful in Canada. That being said, this almanac includes the complete issues of the magazine from January 1989 to June 1995, and can be searched by person, topic or word.

So, if your child is doing a research paper on the Hubble space telescope, a search for Hubble will lay out a timeline of articles on Hubble's highs and lows since its inception. Students can then independently search the Web for the current status.

The CD-ROM also contains views, photos, videos, etc., on several topics such as environmental concerns like the Exxon-Valdez disaster. There is a mini atlas for the United States as well, with maps and all sorts of statistical information. Perhaps this could be useful for geography or history courses. In this vein, there are 2,000 historically important articles dating back to 1923. The original commentary on some events, which may be viewed in an entirely different context by current historians, is very interesting. It makes a reasonable companion to the Multimedia Encyclopedia.

Compton's 1997 Interactive Encyclopedia is easy to navigate and comes with extras such as a planetarium and related game. The search engine is fair, but I have been spoiled by the one in the Canadian Encyclopedia Plus. However, for an encyclopedia of international scope, this title does have reasonable coverage of Canadian topics. Particularly good is the coverage of early explorers and early Canadian history and development. You can display the search box, a video and a text entry simultaneously.

One of the features advertised on the box is the ability to download monthly updates for the encyclopedia. It could be a great idea, but as with many programs that supposedly link you to sites on the Internet, there are problems. With this disc, when you try to reach the Internet, it first tells you that "your selected" server is AOL (America Online). For most of us, it isn't.

You can customize that and the program will dial and connect without much fuss to your server. The only problem is that you can only get the monthly update downloads *if* you subscribe to AOL.

This type of Internet connectivity is common with the current crop of CD ROMs from many companies. And some programs will only work with one browser, most often Microsoft Explorer or Netscape. I have used only one program that actually detected what browser I had and proceeded to use it rather than trying to force me to convert. So look heavenward and hope that developers figure out that they must adapt to the user, rather than selling the user a product and trying to force them into using only one browser or a particular access provider.

At the moment it is like buying a particular brand of car which will only run on one brand of gas. So buy software on the basis of content included, not what it might link to (even links can be hastily put-together).

Interactive World Atlas

Estimated street price: $55 to $60

The second package, the Interactive 1997 World Atlas, has all the bells and whistles of a good atlas with maps, statistics, and short articles on each country's culture, history and economy. Even Grade 3 or 4 students should be able to use it, since the interface is so well designed.

As with most computer atlases, there are satellite photos. The fly-bys are an interesting feature, but the content steals the show. Since the product is multimedia, you are treated to videos and sound ➤

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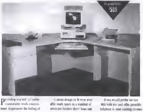

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clips, including 20 common phrases used in 43 languages.

The bonus CD-ROM is Compton's Complete Street Guide to the U.S.A. Useful, I suppose, if you are planning a trip to an American city and want to find specific locations without rushing down to your auto association for maps.

Battles of the World

Estimated street price: $40

The topics of the remaining new Home Library releases relate to the first two like items hastily picked up in a corner store five minutes before it closes.

With nearly 3,000 articles on military history and 10 animated re-enactments of significant battles from Kadesh in 1275 BC to the Gulf War in 1991, Battles of the World will suit military history buffs and be a good resource for schools.

The best part is a detailed discussion and demonstration of the strengths and weaknesses and strategies and decisions that led to victory or defeat for the opponents in each battle. When one side should have won, the analysis points to the bungling and poor judgment or bad luck that caused their downfall.

The bonus CD-ROM with this program is The Atomic Age—good for library shelves or as a reference for school research reports.

Interactive Bible

Estimated street price: $55 to $60

The new international version of Compton's Interactive Bible can be recommended to anyone but a professional Bible researcher. It allows you to read the Bible without a magnifying glass, and will even read it out to you. You can also explore commentary and footnotes with alternative translations, read inspirational interpretations, view an atlas of Biblical regions or develop a personalized study plan set up in two-week blocks and record your thoughts and personal commentary as you study.

Specialized reference tools include the Concordance, a Bible dictionary and Nave's Topical Bible. Sunday school was never this good when I was a child. The search engine is rather good and provides a list of passages, commentary, and videos related to the search word.

I remember reading Genesis, the Synoptic Gospels and John searching for references to "light" for a research paper during my university years. I had to manually type out the passages, then cut them out and paste them with cello tape into the rough draft report. What once took a couple of days of hard research can be done with this program in a few seconds. I was born too soon.

The bonus disc with this title is Children's Bible Stories, which can be read on screen or read aloud. It is split into Old and New Testament stories. The more brutal events in the Old Testament have been sanitized for younger children. This bonus is probably more useful in the average Canadian home than the Atomic Age or U.S. Street Directory bonus discs.

Complete Interactive Cookbook

Estimated street price: $55 to $60

Most homes will probably also be keen to find their space for the Complete Interactive Cookbook. Besides the recipes, this disc includes demonstrations and discussions of cooking techniques specific to a particular recipe, nutritional information for each dish and the ability to resize a recipe for one to a multitude of people. It helps you plan menus using a predesigned set of dishes or develop your own using the Menu Wizard that leads you into a well balanced selection. The only thing the program will not do is go to the store (though it will print out a shopping list), or cook the meal for you.

As a wedding present, this would make a great alternative to the 11th toaster or sixth electric carving knife. It would also be a nice present for empty nester parents still trying to adapt to cooking for one or two instead of a large family.

The bonus CD-ROM is a wine course. It will not wow you with multimedia appeal, but the content is adequate, with a glossary, world atlas of wines (carefully ignoring Canada) and discussions of such things as how flavor is determined in wine and wine types.

The Genius of Edison

Estimated street price: $40

Last but not least is The Genius of Edison, and this interactive history lesson of some of the American inventor's successful and not-so-successful inventions is a winner.

This disc is an example of the new look of history offered by computer technology: watch old film footage, view newspaper articles and advertisements for Edison's inventions, explore hyperlinked articles or figure out how the inventions worked with animated demonstrations.

For kids, there is a section that allows them to write their own messages in Morse code, the standard for distance communication a century ago. My boys were delighted to find a translation of dots and dashes to letters and spent several hours writing and sending messages, something they had been dying to do after going through the 1900 train station in a local heritage village.

The bonus CD-ROM, Leonardo 2.0, is another plus. It is an extension of the first CD-ROM that Compton's produced on the inventions of Leonardo da Vinci. Again this will appeal both to the "techies" and the art or history buffs in your family or school. Da Vinci's drawings of devices for warfare, engineering, musical instruments and flight were hundreds of years ahead of their time.

Compatibility

Only the Genius of Edison and Battles of the World run on both Windows 3.1/95 and Macintosh platforms. The current releases of the Interactive Encyclopedia, Interactive Atlas, Interactive Bible and Complete Interactive Cookbook will only run on computers using Windows 3.1/95 operating systems. ❑

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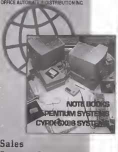

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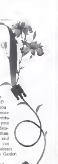
Computer-aided gardening

Software and Internet sources to aid your green thumb

BY MARTIN P. WATERMAN



I once asked an editor of a gardening magazine if she wanted a piece on gardening software and Internet resources. She said no, explaining that computing and the enjoyable and often sedating practice of gardening could never be mixed. This seems to be a common sentiment.

So how helpful can a computer be to your gardening? The answer is quite simple: the more extensively you garden, the more helpful your computer can be.

With your computer and the right software and Internet resources, you can design your garden or home landscape, set up maintenance schedules, learn about thousands of ornamental or edible plants, calculate yields and identify and learn about how to deal with insects and diseases chemically or organically. You can also read about the latest varieties of plants and research (often as it is happening), or learn about gardening associations. Perhaps best use of all, via the Internet, you can network and communicate with people who share your interest.

How much gardening information is there on the Internet? A simple Infoseek search on "gardening" found 40 281 documents that contained that word. The topic is a perennial favorite for book publishers and television producers and, lately, gardening software titles have also been springing up like weeds. Following are some gardening resources worthy of attention.

Software

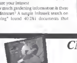
Garden Encyclopedia, 3D Landscape 2.0
From: Books That Work
Price: $28.95 (Encyclopedia), $68 (3D Landscape)

The Garden Encyclopedia is a great little reference tool with a searchable database of more than 1 500 plants. You can set your own search criteria, or simply peruse the information and photographs of plants or watch the video footage demonstrating various skills, such as starting seeds or transplanting. This is a great product for the novice as well as the professional gardener.

Another Books That Work product—and one of its best—is its newly revised 3D Landscape 2.0, which is now available for Macintosh. If you are thinking of major landscape renovation or construction, this product is a must—period! It is much easier to drag and drop that virtual tree or shrub and reposition it on your computer screen than to do it in real life.

With this product, you can also see how much sunshine areas of your landscape will get and at what time of the day. One of the best new features of 3D Landscape is WalkAbout, a 3D mode that lets you interactively experience your landscape in a virtual tip-toe through your tulips. The plant database now has more than 2 200 trees, shrubs and flowers, plus you can import plant databases such as the one in Garden Encyclopedia.

Often these products come bundled together, so check out the Books That Work home page for the latest specials. Landscape software is also available from many other vendors such as SoftKey, Abracadata, Expert and many others. However, Books That Work continues to lead the pack for those planning serious landscape installations. ►



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The Encyclopedia of Hydroponic Gardening
From: Nelson Pade Multimedia
Price: US$30

This CD-ROM is a strong introduction to the topic of hydroponic gardening for those who want to explore this high-performance method of growing plants without soil. The disc is available from the company, which also sells other hydroponic information including videos.

Contact: Nelson Pade Multimedia Tel: 209-742-6869
Web site: http://www.mse.mariposa.ca.us/hydroponics/hydrocdr.html

Landscape Architect
From: SoftKey
Estimated price: $52

A new Softkey title, Landscape Architect, allows you to plan a garden of virtually any size and a 3D option lets you view your plan more realistically. One of my favorite SoftKey titles, The Exotic Garden, has been discontinued (you might be able to find it in the bargain bin at your local software store). Softkey has merged with The Learning Company.

Contact: The Learning Company Tel: 800-227-5609
Web site: http://store.softkey.com/

Garden Companion Deluxe
From: Lifestyle Software Group
Estimated street price: $70

Probably my favorite gardening program is Garden Companion Deluxe. The latest edition continues the excellent standard set by earlier versions. This is a fully integrated program including a planner and a 2,500-item database. It also includes all the plants available on the company's other programs: Garden Club Perennials, Garden Club Edibles and Garden Club Roses.

A useful feature is the perpetual care calendar, which gives you a monthly to-do list for your specific plants. If you don't want to devote too much grey matter to your garden, the program includes a Plantype Filter. With it you pick a plant that already thrives in your garden and the program suggests others that will do equally well.

Also included are sample garden plans and a photo gallery, making this a very complete and enjoyable program. Garden Companion Deluxe is well worth the price because of its high-end features. With the high cost of landscape plants, selecting a few that won't die and will give years of pleasure is what makes this price justifiable.

Contact: Lifestyle Software Group Tel: 800-289-1157
Web site: http://www.lifeware.com/

Complete Gardening
From: Microsoft
Estimated street price: $50

Another heavyweight gardening program is Microsoft's Complete Gardening, part of the

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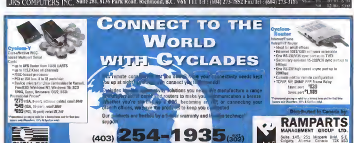

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popular Microsoft Home Series. It is based on the American Garden Guide Series. Complete Gardening has five regional garden tours and while they are American, much of this information is applicable to our

Great White North. The Plant Problems section is good, but I prefer the Internet for this type of information as searches provide more in-depth information and a wider spectrum of sources and remedies. The Techniques and Advice section is also very good, particularly for new gardeners. Being a more experienced gardener I found myself saying "knew that," "done that," "been there" too often. Complete Gardener is widely available.

Contact: Microsoft
Web site: http://www.microsoft.com

Limitations of software
The usefulness of gardening CD ROMs is limited. Although compact discs can hold a lot of information I am still waiting for a resource that, instead of listing thousands, lists tens of thousands. With a program that lists as many as 5,000 plants, only a fraction of that amount will really be appropriate for a garden in a given area once soil and other conditions are factored in. Software also tends to focus on popular cultivars, often passing over regional gems.

Internet resources

Web sites
For gardening ideas and information, the World Wide Web is more fertile ground. Fungus, disease or pests picking on your petunias? A simple search can not only help you identify the bandit but provide you with cures from home remedies to the latest in organic and high-tech insecticidal warfare.

Although gardening involves much perspiration, if you are stuck for inspiration, visit the American Association of Botanical Gardens and Arboretum site http://www.mobot.org/AABGA/tabga.member.lst.html

There you'll be treated to over 50 arboretums that you can explore online. Using other links you can explore additional arboretums all over the world, many of which have highly developed sites with virtual tours and cultural information. I can hardly wait til these sites employ real-time, high-quality video.

It is hard to recommend Web sites for a topic as broad as gardening. The real fun of the Internet is honing in on a topic you want to explore. Maybe it is grapes or ➤

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growing your own tea or where to find banana corms to grow bananas indoors. The challenge is realizing that the fruits of your imagination can be nurtured by the information and contacts on the Internet

A year ago I could list you dozens of my favorite sites Now, I use hundreds of them as I need them For instance I had a problem with a pest called the curculio A search provided hundred of sites including the latest research from several universities on how to control this pest I had the information I needed in minutes It is hard to play favorites when there are so many resources No one site can satisfy a fraction of your needs and of course your needs are always changing

Newsgroups

There are many garden and gardening related newsgroups The following are my top-10 picks

- **uk rec.gardens** This is my current favorite and rather a new kid on the block The Brits have long been known for a love of gardening that often borders on obsession In fact gardening is also central to many who practice New Age religions, as herbs medicinal plants and natural nutrition are a source of healing. This newsgroup provides novices and experts alike with a wide selection of often arcane and hard to find information and every question and topic seems to be treated with a high degree of thoroughness and seriousness
- **rec.gardens** This is the king of garden newsgroups This time of year there are often over 1,000 postings If you can't find your answers there you have *real* garden problems
- **rec.gardens.roses and rec.gardens orchids** As their names indicate, these are two specialty newsgroups
- **alt building.landscape and alt landscape architecture** • If you are considering major landscape construction or have always wanted to landscape using stone and concrete, these two similar newsgroups are good sources.
- **sci agriculture and sci agriculture.fruit** If you look at your garden as your farm or want to grow fruit head to these newsgroups
- **alt bonsai** This is another busy garden group that deals with all matters related to this popular and ancient oriental discipline of growing miniature trees and plants
- **rec.food.preserving** If you've managed to grow a bumper crop thanks to the other newsgroups, this newsgroup will provide you with numerous ideas on how to preserve your bounty ❑

World's largest software catalog • NB—The Filez software database has expanded to include a "Yahoo like" interface to allow users to browse through software records. The Filez database includes information from thousands of FTP sites on the Internet and the new catalog includes over 10 million Macintosh and Windows files, according to Filez

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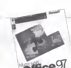

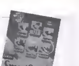

Suite shoot-out:

Office 97 vs. SmartSuite 97

BY ROD LAMISANO

Three horse race

Lotus, Microsoft and Corel are in a three horse race to own what is commonly called the suite business. Each company has bundled together a software package that includes, at minimum, a word processor, a spreadsheet, a presentation program and a database.

While Corel is about to bring its newest release WordPerfect Suite 8 to market in the second quarter of '97, Lotus and Microsoft have their horses on the field today. Here then is a general overview of the top products of the arch rivals: Lotus Development Corporation, child of IBM, and Microsoft Corporation, IBM's estranged partner.

Ancient history

While the Apple Macintosh has always had a somewhat integrated format with a graphical interface, a unified common application format, drag and drop, and cut and paste between applications (not to mention between different data types), the other side of the PC world didn't.

Thus, when the DOS world began to fall to the Windows world, circa 1991, the market was crowded with word processors and spreadsheets that neither looked similar nor worked with each other. In 1993, when Windows 3.1 had won the day, things began to change due to the advent of common features such as cut and paste, Object Linking and Embedding 1.0 (OLE) and the work of standards committees.

At about this time, the makers of programs such as Word Perfect or Ami Pro began to tailor their word processors to spreadsheet programs, giving them not only the ability to work together but a similar look and feel as well. In 1994, suites were becoming popular, more unified and more powerful. The arrival of Windows 95, with its improved OLE ability—with OLE 2.0, 32-bit abilities, as well as the more powerful hardware Win 95 necessitated—made the arrival of truly integrated, multi-function suites the next evolution.

With the emergence of the Internet as a serious force in 1996, Lotus, Microsoft and the new owners of WordPerfect, Corel, began to integrate their suites with the burgeoning Internet. This process has matured in 1997 with Microsoft Office 97 but to a greater degree with Lotus SmartSuite 97. Corel continues this trend with WordPerfect Suite 8 and hints at the next step by including support for the new Intel MMX processors.

Thoroughbreds

Both SmartSuite and Office are mature and rich productivity suites that run on Windows NT or 95. They both come on CD and require between 100 MB and 200 MB of hard-disk space depending on your choices. Both products were released in the first quarter of 1997 and in both, the individual applications have been more tightly tied together by a central program within the suite. Both have award winning applications as part of their suites and both are part of a larger strategy that includes network applications. They also both have strong and deep corporate support and weighty companies standing behind them.

The feature set of any one program in either suite is such that a single review could run thousands of words. This more general comparison is meant as a survey of the two suites rather than a point-by-point comparison of features and functionality. This review is meant to give readers a starting point by comparing the overall direction these programs are taking. More in-depth reviews will make their way to the pages of *The Computer Paper* and its Web site (http://tcp.ca) as part of more specific category reviews.

Microsoft Office 97

From: Microsoft Canada Inc.

Price: Pricing for Office is complex with numerous versions and different pricing depending on user status. Generally, estimated street price for the full Office 97 Professional Edition non up-grade would be $850, while an upgrade price for Office standard edition runs at about $350.

Microsoft Office 97 comprises four programs: a word processor (Word 97), a presentation program (PowerPoint 97), a spreadsheet (Excel 97) and an organizer/emailer (Outlook 97). The professional edition adds Access 97, a relational database. The package also includes Microsoft Bookshelf Basics, a quick reference tool with a dictionary, thesaurus and quotes. The program runs on a multimedia 486 or better running Win 95 or NT.

First out of the gate with an office suite for Windows 95 was, unsurprisingly, Microsoft. Now Microsoft is first with an upgrade. The new suite hasn't arrive unheralded. December '96 saw the Microsoft team touring with the "Windows to the Future" seminar series. The 45-city global tour distributed information and materials on Office 97 to more than 25,000 corporate technology professionals. The tour returned in January travelling to another 30 cities around the ➤

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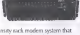

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world with trial versions of Office 97 given away to more than 80 000 MIS (manager information services) executives.

On top of this push Microsoft worked with more than 80 organizations worldwide representing more than one million desktops, as part of its early adopters program (EAP) Many large corporations were represented in the EAP including Ontario Hydro

Clearly this is big business. What is all the fuss about? Well Bill Gates chairman and chief executive officer of Microsoft, says "Office 97 is our most significant release of the suite to date We've invested nearly three years of development time and over 25 000 hours of usability testing to deliver the new capabilities our customers have requested." Microsoft lists four areas where the product is improved. Here are its claims.

- **IntelliSense technology** Office 97 includes a host of improvements based on IntelliSense technology which enable the software to watch what the user is doing and automatically produce the desired result
- **Internet ready** Office 97 integrates Web functionality based on Internet standards into each application to enable users to take full advantage of the Web
- **Powerful custom solutions.** With more than one million developers building custom solutions Office is currently the most popular development platform after the Windows operating system.
- **Smoother migration:** In line with the recently announced Zero Administration Initiative for Windows which is designed to allow companies to reduce the cost of owning and operating PCs significantly Office 97 provides several new and improved tools to minimize the organizational costs of upgrading

Let's look at each claim

IntelliSense Usability and user assistance are greatly improved and it is safe to say that this program is probably the best of any program on any platform in this area The types of features that can be found in the suite include, as-you-type grammar checking as well as spell checking; spreadsheet commands in plain English, natural speech help, animated multimedia assistants, plain language scheduling, and others.

For example, in the calendar section of Microsoft Outlook, typing "two weeks" in the appointment box instantly shows the date two weeks hence Or typing "one week before Christmas" displays Dec 17 and the correct day of the week

Another example is the Office Assistant (an animated help system), which taps on the glass and says, "Moving text can also be accomplished by dragging the text across different fields " Yes you can turn this little feature off, but surprisingly it had some good suggestions All in all this is something Microsoft can boast about

Internet ready: Here again Microsoft has made great strides. The new Office finds every program better integrated with the Internet. As you might expect, Word Excel and PowerPoint files can be saved as Web pages. Web and email addresses automatically become Web links in Word. Clicking on the blue Web link starts the user's browser and loads the page

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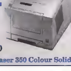

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However the most significant addition is Outlook. Outlook takes the old Schedule+ and recreates the puny personal information manager (PIM) as a new and powerful communication and organizational program. Combining the usual calendar and address lists with an email program allows Outlook to become the only place you need to go to get working. The features of this new addition are extensive and allow the user to track documents and spreadsheets either by contact or in a chronological way. As regards the Internet, it clearly brings the suite together and ties it strongly to the Net. The program is, in fact, Internet-ready.

Powerful custom solutions. Yes, there are many companies and people creating tools and content for Microsoft products and they do, in fact, control most of the market. However, there is no shortage of custom solutions for various other Windows suites. This claim is really appealing to the cautious by pointing out that there is safety in numbers and that each of the components in Office 97 can be customized as a single entity.

VisualBasic 5 is included in the suite, and Microsoft sells a developer edition of Office 97 to allow further customization.

Smoother migration. This claim is based on a number of enhanced wizards that make installing and maintaining Office on a network a bit easier. Mostly, this is about two things. One: Windows machines, in general, and Windows programs, in particular, are still not easy to configure. Two: Macintosh machines, in general, and Macintosh programs, in particular, are still easy to configure. Fortunately for suite makers, there is no Mac OS suite that has the depth of features of Office 97 or SmartSuite 97. (Microsoft has recently hired 100 people to work on producing a Mac version of the new Office as quickly as possible.)

There isn't room to mention the other hundreds of new or improved features in the suite. But I will mention a few small but neat ones. In Word 97 typing small words together, such as "inthe" automatically becomes "in the." Outlook will keep a record of all communication with a contact if you so desire. Formula AutoCorrect in Excel automatically corrects common formula mistakes. ➤

Suite war: In the next heat

At about the time this issue of *The Computer Paper* is being read by hundreds of thousands of Canadians, Corel Corporation, the successful and leading Canadian technology company and makers of the renowned CorelDraw family of graphic programs, will release a new version of Corel Word Perfect Suite.

The release, Suite 8, joins the other suites by bringing tighter Internet integration into all of its applications but also takes the competition to a new level with its ability to utilize the new MMX features of Intel processors. Within suite programs that use drawing or presentation functions, Corel's Suite 8 will be MMX enabled. With a stable of strong core of programs such as Quattro Pro and Word Perfect, Corel will fight the good fight and try to take even more of the suite market from heavyweights Lotus and Microsoft.

This won't be easy as Microsoft has everything going for it including approximately 70 percent of the suite market and an inside line to the next version of Windows. However, if anyone can succeed against that little company from Washington State, it would be Corel. Look for a review of the new suite in an upcoming issue.—*Rod Lamirand*

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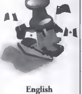

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The Save as HTML Wizard in PowerPoint automatically creates complete Web presentations including navigation controls, frames and animations And lastly Office 97 also takes advantage of the new Microsoft IntelliMouse pointing device which allows users to scroll and navigate through documents with the roll of a wheel.

Overall Office 97 is a real improvement over Office 95 and shows Microsoft's commitment to its Internet strategy and to improving an already exceptional suite of programs. The only consideration that companies and users need to keep in mind when looking at Office 97 is that to get proper performance you should be running on a decent Pentium or equivalent processor Even a fast 486 just drags.

SmartSuite 97

From Lotus Development Canada Ltd
Estimated street price $475 for full edition

SmartSuite 97 comprises six programs a word processor (Word Pro) a presentation program (Freelance Graphics) a spreadsheet (Lotus 1 2-3), a database (Approach) a PIM (Organizer) and a screen capture/macro program (ScreenCam) The suite is pulled together by SmartSuite Center which runs along the top of your screen for easy access Like Office 97, SmartSuite needs a powerful multimedia machine to work well

The most recently released suite SmartSuite 97 is a complete package that builds on the strengths of SmartSuite 95 by embracing the internet moving to all 32-bit code and increasing workgroup abilities Lotus has been aggressively fighting for market share with trade up and cash back offers Last autumn saw Lotus allowing Corel WP Office users to upgrade to SmartSuite 96 for a mere $99 With SmartSuite 97 Lotus is not giving anything away and there doesn't seem to be any need to. SmartSuite 97 can stand on its own legs

Here are the five reasons why Lotus thinks SmartSuite 97 is the best suite on the market today

- **Internet/intranet** SmartSuite 96 was the first suite to deliver specialized tools for finding, publishing, and sharing Internet information, and Lotus continues to innovate in integrating Internet use with "everyday work" in SmartSuite 97
- **Working as a team:** SmartSuite's "Team Computing" features defined the standard for desktop-based collaborative tools and Lotus continues to lead in this arena
- **Up-to-date technology and tools:** SmartSuite 97 provides a full suite of 32 bit applications that take full advantage of the operating environments
- **Information anytime, anywhere** Businesses need to use information from anywhere—the Internet proprietary databases, host systems, line-of business software, real-time data, etc SmartSuite provides tools to find and retrieve all of the information users need at any time
- **One size does not fit all** Users need to personalize their application software developers must build custom business solutions and information system managers require more control of software deployment across organizations

Let's look at these claims

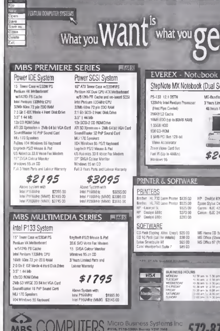
Internet/intranet SmartSuite 96 did get its Internet-focused product out the door first It has been a leader in recognizing the importance of the Net and of nets in general (intranets extranets etc) However with Corel about to release its suite with strong Internet hooks, and Microsoft having already done so the point is somewhat moot

Working as a team Each of the three major suites has created an environment where working as a team is important—after all that is the point of a suite However, none has done so as well as Lotus in SmartSuite 97 Team collaboration such as group editing is possible in Office 97 but the most experienced and strongest in team computing is SmartSuite 97

Up-to-date technology and tools: Now that SmartSuite has gone all 32 bit, and therefore fully compatible with Windows NT it has caught up to Microsoft's Office in this area, SmartSuite is simply getting to where it should be

Information anytime anywhere: Just like Office 97 SmartSuite 97 is part of a bigger picture The suite and its components are ideally suited to network use. The fact that they are written to work with Windows NT, a more and more popular choice for local area network (LAN) operations and the fact that they are fully customizable, is because both companies recognize this is a fight for the corporate desktop more than the individual PC The nature of computing is ubiquity and divergence Any package of essential and intensely used programs that wants to dominate must be able to interface with as many systems, programs, and needs as possible. SmartSuite does this but so does Office

One size does not fit all Again like Office SmartSuite is very customizable For



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example, Organizer can be bent and adjusted in so many ways that you can please almost everyone This ability is becoming more and more common to all types of programs from browsers to graphic programs This is apparent in the trend to floating toolbars As well, companies need to be able to customize suites for security, productivity or even resource reasons Because of the component architecture of the software this is possible and because of the large number of third-party developers with large installed bases, this is easy

The suite is full of great stuff that will be covered in later reviews with a tighter focus, but here is a small sampling SmartSuite Center, which places drawers at the top of the screen for easy access to program icons and other information Includes an Internet drawer If you [illegible] network or have a dial up ISP (Internet service provider) from Home SmartSuite will [illegible] information you have specified and keep it one click away For example on [illegible] we could check at anytime and see the expected weather over the next five days [illegible], the daily listings for a few stocks that interested us (IBM, Intel and Microsoft) and see the top news stories of relevance to technology or computers This doesn't involve starting up the browser If you are on a dial up connection the program signs on for a minute when the machine is turned on and checks back at an interval of your choosing. On a network this updating is invisible

Another example of the little things might be this When the install program had trouble recognizing our modem, and thus couldn't call a toll free number to register the software it simply started up the dial up connection that it found already set up in Windows and FTP-ed the registration data

One more example: While selecting clip art for use in one of the many beautiful templates in Freelance Graphics we saw that there was an option to get more clipart from the Web Excellent SmartSuite 97 is a very Internet integrated, well thought-out office suite with very strong core programs, in particular, the new 32-bit version of Lotus 1-2-3 and the excellent Word Pro

By a nose

These two programs run neck and neck in any comparison. It seems like such a short time ago when any one of the many features found here was considered amazing In today's suites the "very impressive" has become the "expected." No one is surprised when a program automatically fixes your spelling mistakes points out a spreadsheet error or connects to the Internet to complete registration The depth of these programs is truly inspiring as well as empowering to their users. Accolades aside It is time to pick a Review's Choice For its various strengths and tight Internet integration Lotus SmartSuite is currently the best bet for your PC productivity suite.

Contacts

Lotus Development Canada 1700-20 Bay St.
Toronto ON M5J 2N8 Tel 800-GO-LOTUS
Web site http://www lotus com
Microsoft Canada 300-90 Matheson Blvd. W.
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Accounting software for small business

BY JOAN HORNAL

Accounting programs for small and medium-sized businesses are now feature-packed and extremely easy to use. Today's small business owners like graphical (Windows and Macintosh) software because of the ease of installation and friendly user interface You can purchase an incredible Windows or Macintosh accounting system complete with general ledger, accounts receivable accounts payable inventory control, Canadian payroll and project costing for less than $200 Higher priced products included in this review have additional modules or noteworthy features in demand by established businesses

All the products offer you a choice of charts of accounts for different types of businesses Customer invoicing cheque writing and bank reconciliations are standard features. You can track GST on purchases and sales and PST on sales and automatically calculate your payroll taxes (Businesses in Atlantic Canada should note that none of the programs reviewed are pre-configured for the harmonized sales tax—or HST—but all are capable of recording and reporting the new tax) All have the capability of handling one time cash receipts and cash invoices

You can create more than one company, protect your data with passwords customize your invoices and cheque forms track both cash and credit sales and calculate terms and discounts. You can print innumerable reports, including comparative profit and loss statements and balance sheets, aged accounts receivable and payable listings sales analysis and inventory stock and reorder reports. All the products have context-sensitive help, excellent manuals and a multitude of other helpful features

Some programs come only on CD-ROM while others come only on 3.5 inch floppy diskettes Many provide you with a choice Check the box carefully for the equipment required to take advantage of all the product features and ensure you have the necessary equipment to install the program.

Dynacom Accounting

Dynacom Accounting for Windows Gold is a truly Canadian bilingual accounting system One of its strongest features is its flexibility You can open several periods simultaneously and change the system date to enter transactions to another date or period You can customize the toolbar However I couldn't see the buttons well and there is no feature describing the buttons.

You can click on the toolbar or press a function key to search for data by account date, sequence number customer vendor and document number It has a link to your text editor and your backup program It can be networked with Net Bios, Novell-compatible network or Windows Workgroup setup

When you set up a new company, you can copy files from another company or enter accounts directly The account numbers are six digits long. The user can define the last four for balance sheet accounts and the last five for income and expense accounts

Accounts receivable includes order entry invoice processing quotation processing, commission reporting and other powerful features

Accounts payable purchasing and inventory processing can be linked to provide a powerful purchasing system The purchase order module links with the accounts payable module and inventory so when a PO is received the invoice is automatically entered to AP and the receipt to IC If the receipt is incomplete a backorder is created

You can define free form inventory items up to 15 characters in length A four-character category code is used for classifying the inventory Inventory can be standalone or linked to the general ledger You can assign each item to a different general ledger account and define different units for purchasing stocking and selling

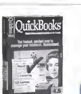
Payroll offers an unlimited number of user definable earnings and deductions, which can be calculated using the formulae supplied The payroll can be computed any number of times before you print or issue the cheques. Each earnings and deduction can be assigned to a different general ledger account for costing purposes Payroll reporting is very complete.

You can use the report writer to create forms and reports or modify those provided with the program

This is a very powerful flexible solution for small- and medium-sized businesses in the construction or distribution industries Some of the more advanced features were not too easy to use so plan to commit some resources for training

QuickBooks Pro

QuickBooks Pro is a very easy program to set up and use yet it has many powerful and flexible features During set up of your company it offers industry specific advice to help you take advantage of these features You can create custom fields to track the special information you require for customers, vendors,



items and employees I like the tool bar, it is big and easy to read You can customize most forms and reports by simply placing a check mark in a box

When you start the program you are presented with a list of things to do today You can drill down from reports and graphs to see the underlying transactions. You can look at an employee list and, by clicking on an employee, you can see all the payroll transactions for that employee from the time the person was hired or go to a sales invoice and locate all the transactions associated with the sale.

General ledger account numbers are totally flexible and you can assign an account as a sub-account Defining classes gives you department costing and reporting Accounts receivable instantly recalls recurring bills and invoices

The retention and management of detailed history records is amazing Purchase ordering is linked to accounts payable Job costing and inventory control for easy purchase management You can create estimates for jobs and compare your actual costs to estimated costs to track profitability, then refer to the estimate for future smarter bidding Time entered on employee time sheets flows to invoices payroll records and job costing for a complete one-step time-management system All this linked information is available at the click of the mouse

QuickBooks Pro is particularly adept at handling GST and PST Most of these functions from setting up the taxes to accounting for a tax refund are handled automatically by the software and covered very well in the manual

QuickBooks Pro converts QuickBooks and Quicken data from earlier DOS and Windows versions

Firms that bill time such as accountants architects, engineers and construction professionals would find this program a big bang for the buck.

Business Vision Encore

Business Vision En[illegible]s product philosophy is that business processes—such as taking an order, receiving goods or creating a purchase order—come first and that business information should be delivered to the user visually—on screen—and quickly The product certainly meets its objective

You can view graphs in the general ledger to compare last year's net change of an account with this year's net change and compare balances by fiscal period You can quickly make inquiries from any account balance to see the underlying information When you view transactions in the general ledger inquiry function you may reconstruct the entire journal entry for any transaction on-screen.

An automatic posting feature can be turned on or off When on all information in the general ledger is real time. When off, you can review and revise the journal entries before posting to the general ledger

All transactions are date sensitive and there is no period-end close function to be concerned with Business Vision allows you to locate a journal entry from any source and reverse it automatically

You can keep up to 99 years of history in both accounts receivable and accounts payable Unlimited notes can be attached to customer details and supplier details. Multiple modules can be open at any one time For example you could access both the inventory item and the supplier screen at the same time Order entry tracks quotes and orders and converts them to ➤

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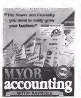
invoices. Back orders are tracked, and when the goods are received the back order is converted to an invoice. Unfortunately the system does not have a purchase order module.

The Canadian payroll module is very simple to set up. It uses a time-card entry system for hourly employees and can automatically create time cards for salaried employees. The time cards can be reused for the next pay period. Supplementary time cards are available for special or extra pay runs.

Encore is designed for retail, service and distribution businesses. The product has a strong point-of-sale module, which can be linked to a cash drawer, invoice printer and bar code reader. You can access information on the inventory file and the customer file from the point-of-sale screen. During entry of the part number, the system displays the description, price and tax codes on the screen. When the quantity is entered, the system determines if a discount applies. When the entry is complete, a payment method window appears and the system calculates change due if any and prints a receipt. Inventory control, accounts receivable and the general ledger are updated automatically for the sale.

If you want to try Business Vision Encore a demo can be downloaded from the Web site (see chart).

M.Y.O.B.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M.Y.O.B. is very easy to set up, you simply select a chart of accounts from the list and begin to enter information. The Wizard guides you through each step of the setup process. In M.Y.O.B. you can start processing your day-to-day entries even before you enter your opening balances. Data is date sensitive. You can have up to 26 open accounting periods. Unfortunately, once a year is closed, paid invoices, purchases and payroll detail is purged from the system.

When you make a mistake, it is easy to drill down to the original entry, change it or reverse it and your records are automatically updated. This feature can be turned off if you are concerned about losing the audit trail. The financial analysis and reporting section includes colorful graphs for monitoring profitability and sales.

Sales and purchases sections offer recurring invoices. These provide a level of flexibility not available in other packages. You can open invoices and purchase orders, enter information and save the form without posting the information to the accounts. These forms can be recalled and reused at any time.

The inventory section offers only average costing and a single price level. However it has an nice build feature that lets you combine single inventory stocking items into a new inventory item for sale.

When you select your chart of accounts the payroll records are already linked to the accounts for you. You can add pay categories (earnings) and deductions and modify those provided by the system. You can override the expense account to which a pay category or employer's portion of a deduction is assigned. There is no time sheet entry function, you simply enter the total hours for the period for the category for the job to the payroll screen and the pay and deductions can be viewed as you process the entry.

If you have set up a job to track reimbursable expenses, you can link that job to a customer so that when you assign expenses to that job they can be recalled and billed with a click of the mouse.

You can enter a budget amount by account for every detail job in the system and the job budget analysis tells you if you are making money on a project.

M.Y.O.B. comes with a card file system that allows you to manage information on your prospects or contacts as well as your customers, vendors and employees. There are so many HELP features I do not have room to list them all here. One notable feature is the CD-ROM online video that presents the help you need in a friendly and informal way (if you have a CD-ROM drive, accelerated VGA graphics card, a Pentium processor, Windows 95 and a sound card).

M.Y.O.B. is available for the Macintosh as well as for Windows computer systems.

Continued on page 96

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Web site (http://www.)	dynacom.ca	intuit.com/canada/Quickbooks	businessvision.com	bestware.ca	accpac.com
Price	$158	$249.95 (Less $50 for Quicken Quicktax users)	$1,195 $499 for three-user LAN pack	$149	$179
Support	Free for 30 days $119 for one year	Free toll free for 30 days. Free 24 hour faxback Web page Ten incidents $149	Unlimited calls $199 per year	Free 30 days introductory support $179 per year	Three free calls in first 30 days $100 for 10 calls
Payroll updates	On the internet	12 months for $59 95	$165 to $195	$28 95 to $38 95	Updates, tax tables $180/yr
Version reviewed	Gold 2 0 1	Pro 4 5	Encore Version	Ver 7.0	Ver 5 0A
Other versions/price	Accounting Pro No Job Cost or Payroll/$71 95	QuickBooks No time tracking and job costing/$139.95	Business Vision 2000 more modules/$3,995	None	None
Languages	English & French	English	English	English	English
Multi company	Y	Y	Y	Y	Y
Multiuser	Y	N	Y with LanPack	N	N
Sample data	Y	Y	Y	Y	Y
Direct Internet access	Y	Y	N	N	N
Report Writer	Y—Forms & Reports	Form & Reports Customizer only	Form Customizer only Report Writer is available as add on	Y—Forms & Reports	Y—Forms & Reports
System requirements	At least a 486 PC Windows 3 1, NT, 95 4 MB RAM, VGA monitor 3 5 floppy or CD ROM drive	At least a 386 PC Windows 3 1, 95 8 MB RAM, VGA monitor 3 5 floppy or CD-ROM drive	At least a 486 DX PC Windows 3 1 or higher 4 MB RAM, VGA monitor 3.5 floppy drive	At least a 386 PC Windows 3 1 or higher 4MB RAM, VGA monitor 3.5 floppy or CD ROM drive	At least 486/33 PC Windows 3 1 or higher 8MB RAM, VGA monitor 3 5 floppy or CD-ROM drive
Internal backup	N	Y	Y	Y	Y
Automatic corrections & adjustments	N	N	N	Y	Y
Import export capabilities	N	Y	Y	Y	Y
Reminders—to do lists	Y	Y	Notepad in AR and AP	Y	Y
Tool bars	Small and hard to see Customizable	Clear and easy to use. Customizable	Clear and easy to use	Clear and easy to use	Clear and easy to use
Graphic reporting	N	Y	Y	Y	Y
Ease of set up	4	3	4	4	4
Ease of use	2	3	3	4	5
Flexibility General	5	4	4	3	2
Flexibility Financial reporting	4	5	5	3	4
GENERAL LEDGER AND FINANCIAL REPORTING					
Account numbers	Structured 6 digits	Flexible up to 7 digits	Structured 10000 to 49999 only	Structured 5 digit	Structured 4 digit
Budgets	Y	Y	N	Y	Y
Bank reconciliation	Y	Y	Y	Y	Y
GST & PST reports	Y	Y	N	Y	Y
Retains detail history	Y	Y	Y (2 years only)	Y (current year only)	Y (2 years only)
Drill down capability	N	Y	N	Y	Y
ACCOUNTS RECEIVABLE AND INVOICING					
Sales commissions	Calculates	Tracks salesperson's sales	Tracks salesperson's sales	Tracks salesperson's sales	N
Pricing levels	5	1	4	1	1
Credit tracking	Y	Y	Y	N	Y
Batch invoicing	Y	N	Y	N	N
Back order tracking	Y	N	Y	Y	N
Quotations	Y	Y	Y	Y	N
PAYROLL					
Number of Earnings,	Unlimited	Unlimited	Limited earnings	Unlimited	Limited earnings
Benefits & deductions			5 deductions, 5 benefits		Limited deduc., 1 benefit
Uses formulae	Y	N	N	Y	N
Prints T4 & releve	Y	T-4 only	Y	Y	Y
Prints ROE	Y	Y	N	N	N
Vacation pay and sick leave accumulators	Y	Y	Y	Y (vacation)	Y (vacation)
Retains pay history	Y	Y	2 years	Current year only	2 years
JOB COSTING					
Budgets	N	Y	N	Y	N
Auto invoice expenses	N	Y	N	Y	N
ACCOUNTS PAYABLE AND PURCHASE ORDERS					
Postdated cheques	Y	Y	Y	Y	N
Purchase orders	Y	Y	N	Y	Y
Back order tracking	Y	N	N	Y	Y
Retains PO history	Y	Y	N	Y	Y
INVENTORY					
Item numbers	15 characters	13 characters	15 characters	13 characters	13 characters
Automatic price changes	Y	Y	N	Y	N
Costing method	Standard or Average	Average	Average	Average	Weighted moving average
Bill of materials	N	N	N	Y	N
Physical inventory count sheet	N	Y	Y	Y	N
Reorder reports	Y	Y	Y	Y	Y

TABLE EXPLANATIONS

The tables provide a comparison of other available features, some of which require further explanation.

Direct access to the Internet is a new feature in many products. You simply click on a button or icon and access the Internet from your accounting program.

The ***report writer*** options vary from slight form modification to full customization of reports and forms.

The ***automatic adjustment*** feature allows you to locate a transaction, easily modify, delete or reverse it and leave an adequate audit trail.

You can ***import and export data*** from other programs such as spreadsheets and word processors for mailings or further analysis.

Structured account numbers restrict you to a predetermined series of numbers for asset, liability and income classifications.

Some but not all programs offer you the capability ***of drilling down*** from an account balance to the source document, a feature that makes finding information faster and easier.

Generally, the more flexible products are more difficult to set up or to use because of their complexity. ***Ease of use and flexibility*** are ranked from a high of 5 to a low of 1.

Some products allow you to assign different ***price levels*** to different customers.

You can assign ***credit limits*** to customers and the program will warn you if the limit may be exceeded by an order.

You can sometimes prepare a quotation and convert the ***quotation*** to an order or an invoice.

Some products allow you to print and track ***purchase orders*** and back orders.

Prices can be changed automatically or globally by assigning a percentage or amount to a group of inventory items.

Programs with ***bills of material*** allow you to ***build*** a new inventory item by combining other items in stock.

Payroll programs that ***use formulae*** for the calculation of earnings and deductions offer more flexible payroll options. Vacation pay and sick leave accumulators accumulate and pay out amounts for vacation accruals and sick leave.

Job costing with ***budgets*** allows comparison to budget for each general ledger account tracked for a job or project.

Automatic invoicing of expenses is accomplished by assigning expenses to job and customer at the time the expense invoice is recorded. These expenses can be accessed and entered automatically to the customer invoice.—*Josh Hamel*

Apple to release 300 MHz PowerMacs

BY BICHARD BOWERS

CUPERTINO, Calif (NB)—Apple Computer Inc said they will be shipping the Apple Power Macintosh 6500/300, claimed to be the first 300 MHz system later this spring. The new Power Macintosh 6500 line comes in five configurations ranging in speeds from 225 MHz to 300 MHz, with some models shipping now

The new PowerMacs will start at US$2 000 for the Power Macintosh 6500/225 to around US$3 000 for the top-of the line Power Macintosh 6500/300 Apple says the new series is designed to run Mac OS 7 6, the upcoming Mac OS 8, as well as Apple's next-generation Macintosh system software Rhapsody

Each model will come with a minimum 256KB Level-2 cache, with 512KB standard on the 6500/275 and 6500/300 systems 32 MB to 64 MB of RAM (expandable to 128 MB) a 3 GB or 4 GB hard drive, 16-bit stereo sound, 2 MB of video RAM, built-in 12x CD-ROM drive, a built in 33 6Kbps modem, keyboard mouse and software bundles. Monitors are sold separately

The Power Macintosh 6500/300 and Power Macintosh 6500/275 systems are not available now and when released later this spring in the United States will be in limited quantities, according to Apple

The Power Macintosh 6500/225 and 6500/250 models are scheduled to be available immediately in the U.S.

When available the Power Macintosh 6500/300 will have a suggested retail price of US$3,000 For that price you don't get a monitor, but you do get 64 MB RAM, 4 GB hard drive 12x CD-ROM drive Iomega Zip drive, 33 6KBps modem, and software including Adobe Photo Deluxe, ClarisWorks 4 0 and Quicken SE by Intuit Iomega Zip drives will be bundled in three of the new models

At the low end of the new offerings available now is the Power Macintosh 6500/225 with a suggested retail price of US$2 000 It comes with 32 MB RAM 3 GB hard drive, 12x CD-ROM drive, 33 6Kbps modem and software

In a related announcement, Apple released data on two new two PC-compatible computers, the Power Macintosh 7300/180, with a 180MHz PowerPC 604e RISC processor and a 166 MHz Intel Pentium processor at a suggested retail price of US$3 200; and the Power Macintosh 4400/200 with a 200MHz PowerPC 603e RISC processor and a Cyrix PR166 6x86 processor at a suggested retail price of US$2 400

Russell Brady a spokesperson for Apple, said these new systems upgrade the PC speed from previous PC-compatible Macs, from 100 MHz to 166 MHz. In addition Brady said that for the first time Apple is bundling Windows 95 ☐

Contact: Apple Web site. http://www apple com

Accounting software

*Continued from page **94***

Simply Accounting

Simply Accounting for Windows Version 5 is an entirely new product Simply Accounting looks different You can now use icons instead of buttons to access ledgers and journals Tool bars and buttons are now available to access commands If you are not sure what a button is for you click on the right mouse button to find the label Wizards help you to set up your information and guide you through some of the more complex tasks such as setting the program to ready mode

Simply can store data for the last fiscal year as well as the current fiscal year This allows you to print comparative financial statements and compare sales information The dates you enter must still be between the conversion date or fiscal start date and the using date

You can prepare and use recurring entries in the general, purchase sales payroll transfers and adjustments journals Recurring

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entries save time, offer greater accuracy of data entry and enhance flexibility

You will like the feature that allows you to adjust purchase and sales invoices and payroll cheques automatically You simply select the incorrect invoice or cheque then enter the correct information The program calculates any differences then makes all the reversing and adjusting entries for you Simply Accounting now has drill down capability to help you find invoices and cheques more quickly You simply click on an account balance and the underlying documents are available for review

You can prepare store and print purchase orders When you fill in a purchase order the program updates the quantity on order and if all items are not received, it keeps track of the back-ordered items and quantities

You can now select the option to use negative inventory quantities. This was frequently requested by businesses that sold inventory before purchasing it or sold inventory before the inventory receipt had been entered into the system You can also track inventory turnover An inventory detail report allows you to determine which items in your inventory are selling and which are not

Payroll is very simple to set up and use You can enter payroll information after the fact or set the program to calculate the deductions automatically You can post entries to the previous year and print T4 slips in a new calendar year This saves making a copy of your data at year end simply for printing T4s

You can now use many more graphs to help you analyze your data and keep an eye on your cash flow and profits. There are graphs for payables or receivables by aging period, for expenses and net profits as a percentage of revenue by account, sales versus receivables, sales versus budget and current revenue versus last year

Simply accounting is what it says. It is very simple to set up and even simpler to use If you are using an accounting program for the first time this one is a good one to choose ❑

Jean V Hornal B.Sc C.G.A. is principal of Jean V Hornal & Co Inc., a public accounting practice serving small businesses in Vancouver She is also a principal of PC Professionals, a consulting firm offering accounting software systems training and support. Contact Jean at 401 1755 W Broadway Vancouver BC V6J 4S5 Tel 604-731-3790 Fax 604-731-0244 Email jhornal@wimsey.com

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in the first week, newly announced Motorola MacOS sublicensee, Vertegri Research, has made Mac history with the imediaEngine, the first MacOS laptop clone

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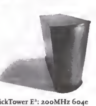

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Douglas Gray, LL.B is a Vancouver-based lawyer by training, a speaker, columnist and author of 15 bestselling business books plus a real estate investment software program His books include The Complete Canadian Small Business Guide *and* Home Inc., The Canadian Home-Based Business Guide *(both published by McGraw-Hill Ryerson) and* Start and Run a Profitable Consulting Business *and* Marketing Your Product *(both published by Self-Counsel Press).*

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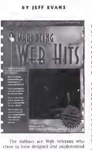

The great thing about the World Wide Web is that it allows anyone, anywhere to display their company to the entire world This is also the worst thing about the World Wide Web Even the tiniest company can, with a good Web site present itself as a professional going concern and at the same time, even the biggest company or government agency can look like a bozo on a poorly designed Incompetently produced site

Producing Web Hits is a book that aims to show would be Web publishers not merely how to avoid embarrassment and wasting time and resources, but how to create Web sites that have appeal, that present an individual or organization in the best light and stimulate positive responses from visitors to the site

The authors are Web veterans who claim to have designed and implemented over 30 successful Web sites, and who earn their living as consultants to corporate Web clients

This book claims early on that it "is not for technical people" It aims rather to be a manager's guide to creating and running Web sites A "manager," however is in effect anyone who wants to run a Web site at whatever level of sophistication and complexity The book attempts to clarify the reader's thinking What am I doing here?" is a question that many would be Web publishers should never stop asking themselves

The book is organized in chapters that are functionally oriented assuming that the reader wants to understand how to accomplish particular goals with a Web site Chapter 1 Hit Factory Making a Splash on the Web describes the basics of the most typical use of a Web site as a marketing and advertising vehicle The emphasis is on understanding how visiting a Web site can be an intrinsically rewarding experience for your prospective visitors so that you can regularly attract the desired visitors, and keep them coming back.

The second chapter, Clarifying Your Mission is aimed at allowing the reader to make the objectives of the Web site clear to give a basis for developing and critiquing the most effective possible site

Subsequant chapters deal with how to organize a Web site project create a distinctive online identity or "personality" for the site getting the site onto an Internet service provider's (ISP s) server, creating or acquiring irresistible content collaborating with other operations on the Net and continually drawing an audience At every stage there is a clear simple explanation of Web terminology and concepts

As well as being a how to guide *Producing Web Hits* is also a good dictionary and primer on understanding the Web and opening the book randomly at any page almost always leads to some useful insights and examples written in understandable plain English

One of the best things about the book is the emphasis on practical concerns In particular the would-be Web publisher doesn't have to re invent the wheel when creating a good Web site There are lots of links to existing exemplary Web sites to provide Inspiration" (or in other words to swipe ideas from) lots of techniques for collaborating with other publishers and lots of examples of low-cost tools and utilities available to make the site more appealing

As the World Wide Web continues to change at an Incredibly fast rate the hot technology will also change and rapidly make current versions of software obsolete *Producing Web Hits* is realistic about this but the book's emphasis on matching technical capability with the interests of both Web publishers and Web surfers is a good basis for any would-be Web site manager to begin to learn this art. ❑

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Weaving your own Web site: Part XX

Designing for WebTV

BY KEITH SCHENGILI-ROBERTS

Late last year both Sony and Philips released WebTV a piece of hardware that connects to a television set, providing a way for people who do not have a computer to connect to the Internet. The chief idea behind WebTV is to make things as simple as possible for the non-computer people, to allow them to join the online community.

WebTV may seem an esoteric subject—the currently installed base of WebTVs is not extensive when compared to those of Netscape Navigator or Internet Explorer users—but considering that WebTV has some special requirements it serves as a good lesson on things to consider when trying to make Web pages as universal as possible.

While it remains to be seen if WebTV will catch on and claim a sizable share of the Web surfing audience, it does have its own special requirements if you intend to write Web pages for that medium. Besides with a potential audience of 95 million homes (almost wholly in the United States) this is an audience Web authors should be aware of.

What is WebTV?

When somebody subscribes to WebTV, what they get from the cable company that provides the service is an Internet terminal (which contains a modem) and a subscription to the WebTV service. Users connect the WebTV to a standard phone line and to their television set. The user then sits back in his or her favorite chair and proceeds to surf the Net via the TV using a device similar to a remote control. Users can send and receive email but the primary purpose of WebTV is to surf the Web.

There are several tips for writing hypertext markup language (HTML) for WebTV that serve as good general tips for Web authors. For example it is a wise to avoid small text sizes in both the HTML or graphics (e.g. an image containing text). This is because small text is difficult to read on a television screen. Also, consider the fact that your WebTV user is probably further from the TV screen than a traditional Web surfer would be from a computer monitor. While this limits Web authors to some extent, it does make Web pages easier to read. By avoiding the use of text that is smaller than the base font size of the browser you can make Web pages easier to read for both WebTV and non WebTV surfers.

Color and images

There are some special color considerations to keep in mind when writing for WebTV. Anybody who looks at a row of different brands and models of televisions for sale at a store will immediately notice that not all TVs are equal when it comes to displaying color. They have a wide range of color hues so what may appear red on one TV may appear pink-ish on another. TVs have a wider variation in displaying color types than computer monitors so do not expect colors to be displayed in exactly the manner specified (this applies even to the "safety palette" discussed earlier in this series).

In particular HTML authors creating Web pages for WebTV should not use full red (**#FF0000**) or full white (**#FFFFFF**), as they both cause distortion on a TV screen so that the edges of the page will appear to bow. Instead it is recommended that HTML authors try substituting a color value that is 90 percent white, like using the WebTV color names "linen," "whitesmoke" or the more universal hexadecimal color value **#EFEFEF**. This is a good practice because while black text on a white background is easier to read than on light gray (the typical background default color for many Web browsers) it is also harsh on the eyes, and can cause eye strain in the user. Reducing the contrast between background and text can make Web pages easier to read.

When it comes to images there are a lot of sensible suggestions that apply to WebTV but are equally useful when writing HTML for other browsers. It is good to consider the order in which the parts of the page display on screen. In general text displays faster than images and small images load faster than larger images. So try to place any large images you have on a Web page below the part of the screen that is initially visible so the user can read the text while the image finishes loading. When possible try using JPEG images instead of GIF, as the file size of the former tends to be smaller than the latter. The extra compression involved in the JPEG format does entail some extra number-crunching by the computer or WebTV to process the image but as CPUs get faster this is less of an issue. JPEGs also have a much wider palette of colors (numbering in the millions) as opposed to the 256-color GIF palette.

When possible try to reuse the same image within your Web pages, so that you can take advantage of automatic caching abilities of most Web browsers and WebTV. In addition it is always a good idea (WebTV or no) to use the <IMG> tag's **WIDTH** and **HEIGHT** attributes with an image file so the browser does not have to process the size and width of an image before presenting it on-screen.

If you don't have a WebTV Internet terminal handy (and if you are in Canada WebTV

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is pretty rare), you can get a rough idea by increasing the default point size of your browser fonts to 18 points, narrowing the window a little (so that it matches the dimensions of a TV screen) and then observing the effects.

WebTV's specialty channels

For those who are interested in crafting Web pages that cater specifically to WebTV viewers, like Netscape and Microsoft, the developers of WebTV have added their own set of HTML tags that work exclusively with their browser. Many of these make a lot of sense when it comes to the WebTV format, while others add functionality that some HTML authors have wished for.

For example, WebTV supports a new attribute for the little-used **<LINK>** tag. The **REL** attribute works with an **HREF** attribute to "pre-fetch" and load the text and images of the next link a user will likely go to into the WebTV's memory. When used within a Web page, it looks like this:

```
<HEAD>
<LINK HREF="nextpage.html"
REL=NEXT>
</HEAD>
```

So when the user goes to that page, it loads up almost instantaneously.

WebTV also provides some new ways to emphasize and display text within a browser display. The **<SHADOW>** tag renders text with a slim black back-shadow. The shadow is projected down and to the right of the text, as if a light source were shining upon it from the upper left corner of the Web page. It is a simple container tag, and is used as follows:

What darkness lies in the hearts of men? Only **<SHADOW>The Shadow</SHADOW>** knows!

By default, the WebTV browser will automatically replaces regular quotes (") with smart 66 99 type quote marks (" ") and single quotes (') with smart 6 9 single quotes (' '). This isn't always desirable, especially when you are trying to display such things as computer code, where straight quotes are the norm. In cases such as this, you'd use the **<NOSMARTQUOTES>** container tag to prevent this substitution.

This is only a sample of some of the new tags introduced specifically for use with WebTV sets. There are many more available tags, many of which are designed to enhance and control the way text appears on a Web page. It should also be noted that while WebTV supports much of the HTML 2.0 and a small portion of the new HTML 3.2 specification (officially adopted by the World Wide Web Consortium in January), it does not support things like frames, the **FACE** attribute of the **<FONT>** tag or cascading style sheets.

If you are interested in learning more about crafting pages specifically for WebTV, the canonical reference for WebTV HTML tags and their behavior on WebTV sets can be found at the WebTV HTML Guide and Reference site at: http://www.webtv.net/corp/devdocs/htmlref/htmlref 1.html ❑

Keith Schengili Roberts welcomes any comments, suggestions or HTML tips and tricks you may have. You can email him at: kschengi@interlog.com. His book on HTML, The Advanced HTML Companion *(ISBN 0-12-623540-6) is available in bookstores. Previous articles in the series can be found at* The Computer Paper *Web site at: http://tcp.ca/*

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ViewCall promises Internet TV channel for pennies a day

BY JEAN READ

Canadians will soon be able to turn on their TV set and click to an Internet TV channel ViewCall Canada has announced that it will be the first company to deliver a personal Internet TV channel to Canada

The service, called On TV is scheduled for launch sometime this spring in Manitoba and then later across Canada According to developers On-TV will include a variety of sports news weather business entertainment, travel and kids channels as well as email capabilities and Web access Bob Lantz of ViewCall Canada says the service will cost consumers "just pennies a day"

ViewCall Canada is a new company that represents a joint venture between ViewCall America Inc and MTS Advanced Inc a subsidiary of Manitoba Telecom Services Inc ViewCall America is already operating a similar venture in the United States

Last summer the Manitoba Telephone System launched a consumer trial of its new technology InBox Manitoba in 100 Winnipeg households InBox, developed by ViewCall America featured a set-top box that when plugged into a TV and a telephone line gave viewers the ability to surf the Internet from their couch An infra-red handheld device similar to a TV remote control accessed services The box is expected to retail at $500 Lantz says the success of the InBox trial in Winnipeg led to the joint venture and the On TV launch in Canada

MTS Advanced president Bruce MacCormack says "Forming ViewCall Canada is a major milestone in our mission to deliver On TV as a personal Internet TV channel to Canadian viewers. On-TV is a groundbreaking channel that will allow Canadian viewers to keep in touch with family and friends through email and get personal information of interest"

Consumers would connect to the service via an Internet service provider of their choosing

The personal Internet TV channel technology will be available in a variety of forms. It will come bundled with Internet TVs, Internet set-top boxes network computers and Internet appliances.

ViewCall has formed hardware alliances with companies such as Hitachi Home Electronics (America) Inc Mitsubishi Boca Research Sega of America, Motorola and VLSI Technology

Hitachi announced earlier this year that it will bundle ViewCall's On-TV with its forthcoming Internet TV devices. Mitsubishi will bundle On TV with its Internet-ready Diamond Web TVs—a product the company expects to sell one million of over the next three years

Boca Research plans to bundle On-TV with its low-cost set-top device, which includes an integrated 33.6Kbps modem. The technology has been specifically designed for future migration to 56Kbps model technology ISDN ADSL or cable modem technology

Sega of America will offer On TV as part of its entertainment channel on Sega's Net Link. In addition Sega and ViewCall are working together to develop On TV's gaming channel to enhance Net Link users experience Motorola will use ViewCall's On TV as part of its WebRef design for information appliances

Some of these manufacturers are already promising peripherals such as printers and Lantz says that "as time marches on different manufacturers will be adding different bells and whistles to make their product attractive to consumers."

ViewCall America president Alan McKeon, comments that "Consumer electronics companies should be pleased with On TV's march to Canada because their hardware can connect to a world-class personal Internet TV channel ViewCall Canada's On-TV will bring Internet-TVs and set-top boxes to life

Some of the features On TV will offer are email and personal identification numbers for up to eight family members one click access to Yahoo's Internet guides and access to on-screen TV listings.

Lantz says On-TV should not be compared to a PC experience: "It's meant to be more about making it a TV experience and expanding and enhancing the TV experience and at the same time bringing on entertaining informative information in an atmosphere where the whole family can enjoy it and not necessarily making it a one on one type of approach" He says On TV is intended to be "a very leisurely and rewarding experience for everybody in the family"

ViewCall Canada is also looking for partners to develop compelling content for the new service. ❑

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Web site: http://www viewcallcanada

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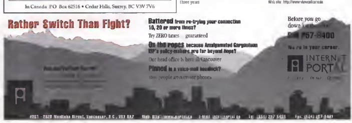

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Reading the Web

Dr. Internet's guide to the top 10 URLs and FTP electronic text sites

BY KEITH SCHENGILI ROBERTS

This month s Web celeb is Internet pioneer Michael S. Hart Project Gutenberg's executive director professor of electronic text at Benedictine University and executive director of Ask Dr Internet. He is also approximately the 100th person to use the Internet and the first to use the Net in the way most people are now accustomed to (i e for something other than geek-speak stuff)

Hart explains his choice of top Web sites 'My top 10 is chosen based on looking for information on the Internet in general I include FTP sites because a person with a filename can get information via FTP faster much faster than via a World Wide Web site

"Being a computer geek, I will start my list with number 0

0 Search engines • Since Yahoo has already been mentioned in a previous Top-10 column I will just list a few search engines here that I recommend as Dr Internet. Many of these search more than one database.

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Excite http://www excite com/
HotBot http //www.hotbot com/
Inference http //www inference com/
Internet Sleuth http //www isleuth com/ (Internet Sleuth)
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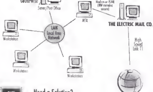

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1. Project Gutenberg sites • Obviously, other than the general search engines listed above I first search the Project Gutenberg database which should be numbering over 1,000 books by the time summer gets really hot Most Project Gutenberg sites are set up for both Web and FTP access (We would *love* to have sites in Eastern central and Western Canada—much of our best volunteer work is done in Canada If we can continue to grow as we have and if copyright is not preserved as it was designed we may be limited to one percent of one percent of one percent of what would have been in the public domain) Starting west to east from the West Coast of the United States and then wading into international waters (* marks sites I am personally involved in keeping up to date)

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Moscow Russia http //www.infoarmika ru
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http://www mirrors org sg/pg
http://www sol com sg/pg
Wellington New Zealand
ftp://ftp [illegible] co nz/pub/mirror/gutenberg
Taipei, Taiwan (under construction)

2. Project Bartleby • A mid-sized text-based collection based at Columbia University What makes this one interesting is its well-chosen selection (including *Bartlett's Familiar Quotations Elements of Style* and definitive collections of major poets) and its well-designed presentations
http://www columbia.edu/acis/bartleby/index.html

3 The Online Books Page • A searchable index of thousands of books that can be read in their entirety on the Net for free Also has links to major e text archives, indexes and exhibits all over the world.
http://www. [illegible] mu edu books html

4. A Celebration of Women Writers • A comprehensive guide to online writings by women worldwide up through the early 20th century Also includes biographical and bibliographic information on many of these writers
http://www cs.cmu.edu/afs/cs cmu edu/user/mmbt/www/women/writers html

5 The Voice of the Shuttle • A large, comprehensive index to online humanities resources books, Web pages reviews etc
http://humanitas ucsb edu/

6 The English Server • A site with a similar focus it seems to focus largely on the work that a large collective associated with the site has been working on for the last six years or so
http://english www hss cmu edu/

7. Children's Literature Web Guide • A lot of people write to me looking for information on children's books this is where I send them An excellent collection of children's literature resources for both kids and parents
http://www ucalgary ca/~dkbrown/index.html

8. The Internet Public Library • An ambitious attempt to make the full services of a public library available on the Web This site has accumulated a useful set of resources (including an e-text index with more entries than mine albeit with less of a focus on full text English books) and has both adult and youth services. I hope to see this site and similar efforts flourish
http://www ipl org/

9 Library of Congress • The U.S Library of Congress is about four years into a very ambitious high volume digitization effort and its Web site has a number of impressive collections These include the American Memory exhibits with thousands of texts images and sounds THOMAS, with comprehensive information on federal laws and bills under consideration catalogs of exhibits in the library itself and the Library of Congress catalog, which has information on millions of books
http://lcweb loc gov/

10 Electronic Text Centre • An archive of thousands of texts (both book length and smaller) in detailed high-quality presentations Many of the texts come with illustrations and texts are available in multiple languages Some of it, unfortunately is only available to UVA users but much of it is available to anyone
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Business and legal considerations for Web sites,

BY BRADLEY J. FREEDMAN

Creating and maintaining a Web site presents unique business and legal issues. Whether a Web site is a do-it-yourself project or the work of professional developers and Internet service providers, Web site owners, developers, and hosts must address these issues and their legal rights and liabilities in a timely manner, or risk costly disputes with potentially devastating results.

Internet-related agreements

The relationships between a Web site owner, developer and host should be governed by written agreements that adequately define their respective rights and obligations. The parties should identify and address the business and legal issues that arise from their relationships and determine how risks and liabilities will be allocated. Preparing adequate Internet-related agreements requires an understanding of Internet culture and technical matters.

The World Wide Web

The World Wide Web is the best known and most widely used portion of the Internet. Its popularity is due in large part to the graphical, interactive and user-friendly nature of its point-and-click interface. Web sites are specific locations on the World Wide Web identified by unique addresses known as "domain names" or "uniform resource locators" (URLs). Web sites are hosted on Internet-connected computers, which permit Internet users to access the sites.

Web sites ordinarily comprise groups of files (known as "Web pages") linked to a main page (known as a "Home page"). Web sites have three components: the content (text, images, video, audio), the user interface (the look and feel of the site, including screen design, organization, and operational features) and the underlying computer software and programming (which operates the site and permits Internet users to access and interact with the site).

Web site creation

Web site creation is a combination of artistic creativity and technical computer programming. There are usually a number of phases in a Web site project: conceptual design, development, testing, and maintenance. The following is a brief overview of common business and legal issues relating to Web site creation.

Site specifications

Clear specifications are essential to ensure timely and on-budget delivery of a Web site that meets the owner's expectations. Web site design, content, and functionality should be described in detail. The specifications should also address technical issues, such as compatibility with host server hardware and software, Internet browser compatibility, use of up-to-date Internet technology, and maximum page download time. The specifications may also require that the Web site be completely portable and easily transferable to different hosts.

Cost, timing and payments

The total cost of the project should be agreed upon. There should be a clear timetable for each phase of the project, and payments should be tied to objective project milestones. Final payment should not be required until a fully operational Web site is installed on the host server and has been tested in real-world conditions. A reasonable payment schedule will help ensure the project is completed properly and in a timely manner.

Content responsibilities and control

From the owner's perspective, he or she should have absolute editorial control over the Web site design and content. Responsibility for providing content should be allocated between the owner and the developer. If the content originates from third parties, the party obtaining content must obtain adequate assignments or licences to use the third-party content.

Ownership

Ownership of copyright and moral rights in the Web site and its components is a crucial intellectual property law issue. From the owner's perspective, he or the should ensure that he or she has the absolute right to use, reproduce, distribute, and modify the Web site and its components. However, the designer may also wish to either retain ownership of certain Web site components or have the right to use them in projects for other clients.

As a general rule, under Canadian law the author of a work (or the employer, if the work is created in the course of employment) is the owner of the copyright in the work. On the other hand, as a general rule, copyright in a work created by an independent contractor is owned by the contractor and not by the person who engaged him or her to create the work. Accordingly, in the absence of a proper assignment agreement, copyright in a Web site designed and created by an independent contractor will belong to the contractor and not the owner.

There should be a clear written agreement regarding copyright ownership and rights to use the Web site contents and components, including appropriate legally valid written copyright assign ►

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- 1 E-mail Account
- News Group Access
- FTP

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Business Plan A $60/month
- 60 Hours of Access Time
- 10 E-mail Accounts
Business Plan B $40/month
- 30 Hours of Access Time
- 2 E-mail Accounts
All Business Plan includes
- 10MB of Web Page Storage
- World Wide Web Access
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ments. In the absence of such an agreement the Web site owner might not own important parts of the Web site

Warranties and indemnities
The developer should warrant that the owner's use, reproduction, distribution, and modification of the Web site and its components will not infringe other persons intellectual property and other rights. The developer should indemnify the owner against claims by third parties for violation of their intellectual property and other rights arising from the developer's work

Termination
Termination rights and the consequences of termination should be clear. These include the form and length of termination notice the fees or penalties payable by the defaulting or terminating party and resulting ownership rights in the work or the work in progress

Malfunction liabilities
The developer's liability for Web site malfunction should be defined. This is particularly important for commercial Web sites, where a malfunction may result in substantial financial and other losses to the owner

Deliverables
There should be agreement regarding the nature of the work product to be delivered to the owner, including Web site contents in printed and electronic format, software in both object code and source code, logic manuals and flow charts, and all other material necessary for the owner's operation and enhancement of the site. The developer should also be responsible for transferring the completed Web site to the host server and ensuring that the site is fully functional on that server

Other services
There should be agreement regarding any additional services expected of the developer and the costs of those services. Common additional services include training, support, maintenance, periodic upgrades and additions to Web site contents, and Web site promotion through registration with Internet search engines and directories.

Development credit and non-competition
There should be agreement on the manner, if any, in which the developer may use the site as a marketing tool and whether the site will indicate the developer's involvement in the site (known as a "development credit clause"). The owner may also wish to restrict the developer's right to create a competing Web site for a limited period of time

Confidentiality
The developer and its employees and contractors involved in the project should agree to keep confidential all information they obtain regarding the Web site and the owner's business.

Insurance
The owner and developer should assign responsibility for obtaining insurance coverage for potential risks and liabilities. The international insurance market is preparing to provide coverage for business on the Internet. Coverage will soon be available in Canada for Internet related libel, malicious falsehood, false attribution of authorship, passing off, unintentional infringement of intellectual property rights (copyrights, trademarks, patents, moral rights, service marks, and registered designs), unintentional breach of confidentiality, infringement of privacy or publicity rights, and negligent misstatement. ❑

Bradley J. Freedman is a trial lawyer with the Vancouver law firm Ladner Downs. He specializes in intellectual property law and commercial litigation. He can be reached by email at bfreedman@ladner.com

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Newsletter basics

a guide to giving hobby, club or small business publications some professional polish

BY JEAN ALLEN IKESON

Some projects seem ideally suited for computers. Newsletters are a prime example. Gone are the days when typewritten items were "pasted" together with photos and bits of graphics cut from magazines. Now even amateurs can produce professional looking results with home computers, laser printers and $100 software that holds your hand through the entire process.

General hints

Whether your newsletter is for a small business, association or club, the principles of design are the same. The idea is to attractively present information and event reminders. The sad fact is that even though you have poured your heart and soul into the production most people allot only five minutes of casual reading or scanning, if you are lucky.

So the key is to grab the reader's attention while emphasizing the most important events or items using placement, font size and type. You should try to get your overall message across in the first 30 seconds. If it isn't clear in that amount of time, you may have lost your audience.

Begin by looking at other newsletters. Make a list of what you like and what you dislike or find annoying.

Consistency pays

People like consistency, so it's a good idea to publish your newsletter at regular intervals, for example monthly. It is also important to spend some time planning the basic format, and then maintaining it for each issue. This way readers can find key items, like information on group meetings, where they expect them to be. There is always room down the road for surprising graphics or articles that wow.

Goals and targets

Ask yourself why the newsletter is important. For a club, it might be to provide a calendar of events, the names and phone numbers of key individuals, reports on speakers, shows or meets. For a small business, it might be to inform customers of new products and specials, phone numbers for regional sales personnel and to maintain the company image—for instance as a reliable source of products or as an innovator.

Or it may be advertising disguised in a newsletter format. For example, I do a one-page flyer annually for a breeder of black angora goats. The content of the flyer is primarily text, a description of the breeding program, with smaller amounts of information on fleece products. The content adapts well as a newsletter: large title, large centre box of text in two columns with a couple of side boxes listing products and ordering information across two columns along the bottom.

This is a case of letting the essential product command the design. Avoid the temptation to show how clever you can be with multiple fonts or jazzy borders. An English teacher drilled into me in the eighth grade: if something doesn't add, then it subtracts. For newsletters, you might change that to: if something doesn't enhance the product or essential information, then it detracts from communication.

For clubs, put a list of coming events on the first text page and a small box with a table of contents to attract attention to the rest of the issue. Put notices, pleas for help or membership forms on the back page (try to always put something nonessential on the reverse side of any form, so that interesting articles are not lost if the reader wants to clip out the form).

As a designer, you are like a police officer directing traffic. You want to direct readers to the key components and encourage them to actually read as much of the material as possible. Good design, good articles and good editing will attract attention and produce a loyal following after a few issues. So choose a template or design that is relatively simple and uncluttered.

Practical considerations

Also consider a few paper options. Each sheet of 11x17 inch paper (tabloid size) folded in half will give you four 8.5x11-inch pages. Legal paper (8.5x14 inches) folded in half produces four 7x8.5-inch pages. You could also use standard 8.5x11-inch letter-size sheets stapled together.

This all assumes that you will use a photocopier to produce multiple copies. If so, the page size limits of your photocopier will dictate your choices. But even if you decide to have your newsletter printed on an offset press, remember non-standard sizes will likely be more expensive to print, and often more expensive to mail.

As a rule of thumb, you can put five 8.5x11 inch sheets of standard-weight copy paper in a standard 9.5-inch envelope without bumping up mailing costs. If you are a company, you may want to pull a few tricks to make your newsletter "jump" out of the stack of mail on someone's desk. ➤

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Microsoft Official Curriculum Course Offerings Spring 1997

Course		
Accelerated Training for MS Windows NT 4.0	(5 days)	May 12-16
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Core Technologies of Microsoft Exchange Server 5.0	(5 days)	May 26-30 June 23-27
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In this case, consider a newsletter size of legal or standard paper folded in half and stuffed into an appropriately sized envelope without further folding. The postage cost for this will be higher than for a standard envelope if mailed in Canada (for bulk mail of larger runs of 10,000, 9x12 envelopes are very economical).

Once the newsletter is out of the "bag," colored paper, even if in a bone or other soft pastel, will also make the publication stand out on someone's cluttered desk or coffee table.

Software

To lay out your newsletter, you can use a word processor or a desktop publishing program. Most current word processors, such as WordPerfect, Word, Amipro/WordPro, Claris Works, etc., include newsletter templates. You simply add your own text and graphics. For many newsletters, a word processor is all you need.

Entry-level desktop publishing programs are inexpensive, and provide more versatility when it comes to placing text and graphics on a page.

These products also include predesigned templates or layouts. But they also provide the fonts, column arrangements and boxes for graphics. Of course, they can usually be customized somewhat but are not as flexible as the professional products, which usually retail in excess of $500, while home products are usually less than $100.

Corel's Print & Photo Shop, which has a street price of $70, only offers a few newsletter templates but is worthwhile for manipulating photos, making flyers or cards. Press Writer, street priced at $50 from Broderbund, has more templates and is designed for flyers and newsletters specifically.

Microsoft Publisher 97, street priced at $100, borders on a professional product, has loads of templates and clip art but only runs under Windows 95. However, it is easy to use. It only took my 10-year old two hours from loading to finish to write and design (using a template) a newsletter for a class project. The bonus is that the learning curve is short and the help wizards are terrific on the home products, whereas you may spend a few weeks grizzling over the lack of user friendly features that newer home products offer.

So how does a word processor differ from desktop publishing software? The former treats the file like a continuous text file. Add a paragraph and it moves everything that follows. A desktop publishing program works like a jigsaw puzzle. Each piece fits with the next but is independent. If you add a paragraph, it may extend on top of the next article. So you just resize and rearrange the puzzle pieces for a perfect fit. If you only half-fill the space, it does not affect any other text or graphic box physically.

You may also want to add more clip art, photos or your own graphic creations to enhance your newsletter. The home products come with some clip art as a bonus. Or you can go wild and buy clip art packages available at most computer retail stores. You open an image and export it to a directory on your hard drive from which you can import it into your newsletter program.

Print and Photo House, Adobe PhotoDeluxe, MGI PhotoSuite and Microsoft Picture It! are members of a new breed of image editing software that allows you to easily manipulate photographic images. Use one of the photos that comes with the program, import one or scan one in with a scanner. Then run down the menu of things you might want to do to the photo, click on it and it allows you to review the change before you actually execute it. Some of these programs allow you to add wild effects, clean up spots or creases, turn the photo into a pastel drawing look-a-like, remove a color such as a black background or do mechanical modifications like resizing and cropping.

Older versions of Corel Draw are relatively inexpensive, come with Corel Photo Paint and will do much the same thing but won't hold your hand along the way. Unless you plan to move toward full-color reproduction in your newsletter, you probably don't need to consider professional desktop publishing programs, such as Adobe Pagemaker, Quark XPress, or Corel Ventura.

However, if you intend to send your file to a service bureau to be image set on a high-resolution device (instead of printing it out on your laser printer), you should first find out what kinds of files the service bureau will handle. Most will only accept files from high-end programs like PageMaker or Quark. Some will only accept Macintosh files or PC files saved in encapsulated PostScript (EPS) format. (Several articles could be written on the subject of working with a service bureau. It's beyond the scope of this article, but if you are interested, you might want to enroll in a desktop publishing course usually available at your local school or community college.)

Putting it all together

The fun part is designing and polishing your product. If you are also the editor/proofreader, you'll have to make sure the articles you receive have no grammatical or spelling mistakes. With a newsletter, you are attempting to make your pages look more those of a newspaper or magazine, so there are some typographical conventions you should adopt.

Start by searching and replacing the two spaces after each period with a single space. (Many people were trained to insert two spaces after a period in high school typing class.) The extra space leaves white gaps in your copy that begin to look like rivers going down the page. Also replace the typewriting convention of two dashes (—) with a long dash (—). (On a Mac, use option shift hyphen. On a PC type in Alt 0150 on the numeric keypad, not the number keys running across the top of the keyboard.) Use typographic or "curly" quotation marks instead of the vertical ones found on typewriters. The current crop of word processors and desktop publishing packages will allow you to add this type of quotation mark. Underlined text is a typewriter convention representing italics. With word processors and desktop publishing software, italicized text is simple, so use italics when you mean italics, not underlined text.

If you want more information on typographical conventions, most introductory books on desktop publishing will deal with this topic.

If you are working with copy that you received via email, you will probably need to clean up the extra carriage returns and symbols that come as extra baggage. You can then either import the copy as a file or simply "copy and paste" it into your newsletter template.

Copy editing

Rarely will you get copy in that does not need a little editing, whether someone has left out a comma, misspelled something or thrown in a few hackneyed phrases.

An editor should be able to make these changes so long as you are not rewriting for the sake of rewriting or changing the meaning. So run the spell checker or grammar checker, break up long sentences and remove useless phrases such as "in order to" ("to" will do) or "all of" ("all" is usually better).

A simple definition of editing is to make sure the copy is correct and communicates the idea clearly. For example, colloquial or pedantic copy interferes with the essential message. Remember: if it does not add, it subtracts.

Feeling rusty on high school grammar? Discount/surplus bookstores usually have grammar and editing guides for under $10. Also, the "bible" of English usage for editors, *The Elements of Style* by William Strunk Jr. and E.B. White, is available in its complete form online at the Project Bartleby Web site (http://www.columbia.edu/acis/bartleby/).

If you are a volunteer editor for a club or association, you will also need to double check dates, make sure you have thanked all helpers and that names are spelled correctly. Sounds simple, but even the best professional editors all have nightmares about spelling errors.

Layout tips

Remember the key is readability and communication. There are a few common layout rules worth following:

- Use the same font for copy (body of the text) throughout the newsletter.
- Avoid widows or orphans, i.e. paragraphs should always have at least two lines at the top or bottom of a column and words should never be hyphenated between columns or pages. Adjusting the column "bottom" or lower margin usually solves this, but occasionally you will have to add or delete a word to remove a hyphen break.
- Keep the title bar for the front page of the newsletter consistent.
- Number pages simply using "3" instead of "page 3" in the table of contents.
- Highlight essential announcements with a box.
- Keep article titles or headlines simple. Centre headlines across multiple columns in longer articles.
- Consider a "pull quote", copying an interesting phrase or sentence from the body of the article, enlarging it and placing it in a box to spark reader interest.
- Thin lines used to separate articles or surround boxes are usually better than thick, which make the box or division appear more important than the content.

Remember newsletters are vehicles of communication, not candidates for the Louvre. Graphics should add interest, rather than be distracting. Gerald Rapley, editor of a newsletter for the Westfield Heritage Village volunteers, maintains a file of 19th century drawings of tools, workers, buildings, etc. to add interest to his newsletter pages. It also sets a "tone" and underlines the "heritage" theme.

When people hand you drawings with labels or legends that are handwritten or have typed labels that will not blend with the typefaces you use, remove them and reset them in a compatible typeface. There are a couple of quick and nasty ways to do this. If the drawing is on paper and you are going to paste it directly onto the master printout, then white out the labels, print more and paste them on with non permanent glue (available in business supply stores). It allows you to move

Continued on page 118

Computer Courses

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For information on course content only, please telephone 528-5546

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ME01	Getting Started with MS Excel	12Hours
MP01	Getting Started with MS PowerPoint	12Hours
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AS01	Getting Started with Simply Accounting	18Hours

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PT02	PC Troubleshooting & Maintenance-Level 2	18Hours

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DM01	Getting Started with Pagemaker	12Hours
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Doin' the neutron dance

Disc tries to deal impartially with history of not-so-distant atomic age

BY JEFF EVANS

The Atomic Files
From: L3 Interactive
For: Ages 10 and up
Requires: Multimedia PC running Windows 3.1/95
Price: $45

The Atomic Files CD ROM gives you that warm, fuzzy, glow-in-the-dark feeling. L3 Interactive, best known for its innovative entertainment software titles, has released a new educational history CD-ROM about the age of the atom, its genesis, and its effects on politics and culture since the first use of atomic weapons against civilian populations in 1945.

"The Nuclear Age is an important part of history still affecting people worldwide today and The Atomic Files will bring this history to life provoking thought and emotion through education. This will be a landmark multimedia CD-ROM," states the disc's producer, Annie Pinsker.

The Atomic Files uses L3 Interactive's Learning Cube interface, which leads users through the information in a very intuitive, non technical way, inviting them to explore and interact with the program.

The Atomic Files creators say they strove to be impartial about this controversial era to allow users to formulate their own opinions. While many might not think there is any reason to be "impartial" about the decision to make the A-Bomb and use it against cities, the attempt to understand rather than denounce it is probably useful.

It's worth remembering too that this title was developed in the United States, and it is especially difficult for Americans—whose development and use of atomic weapons ranks as perhaps their greatest and most terrible achievement—to deal with painful questions of guilt and good and evil pertaining to this subject.

The Atomic Files contains a wide array of text, audio and video information on the Bomb from its origins in a super secret crash program in the Second World War, to attempts to use atomic power for peaceful purposes. There are three chapters containing nine sections that group information into content areas. The original musical score is first rate, and there are video interviews with a person who survived the dropping of the Bomb on Hiroshima, as well as Edward Teller, a lifelong defender of the Bomb and creator of the H-Bomb. ❑

Contact: Learning Cube. Tel: 800-644-CUBE or 310-264-4188. Web site: http://www.learningcube.com

Newsletter basics

*Continued from page **117***

pieces around, does not leave a residue or wrinkle the paper).

A better way is to scan the graphic into your computer with a scanner, place boxes over each old label and "fill" both the line and interior with white or "paper" color to obscure it. Then type in each new label and drag each label box into position. You can use the same procedure for scanning existing maps and placing arrows or enlarged street names to highlight a meeting place. Or build one using the graphics tool box that comes with your program, draw horizontal, diagonal and vertical lines and use the rotate tool to place street names vertically.

Filling in boxes with a light shading or reversing text so that it is white in a solid or patterned box looks great on professional copy, but photocopiers may leave streaks or faded patches. So do a little experimenting before you make your final decision.

Before making a zillion copies

Print a rough copy of the final product. Reread it for errors you may have missed. Look for balance. Some white space will help keep your product from looking like an over-cluttered Victorian parlor. A special graphic will add interest to a large "white hole." Is each page numbered correctly? Is the date and issue number correct? If you have a page of announcements, are the most important ones at the top? Does the "look" convey what you want: sophisticated, lively, intellectual, hottest new product on the block, innovative, cultured, pure business or pure leisure? You can always make a last minute font change, add a bar or box or delete a filler graphic.

Once you have finished, it's time to start thinking about the next issue. Use the "save as" on the file menu bar to create another copy with a new name of the newsletter. Then strip out the text but leave the title bar, titles for monthly columns, etc. and start the whole process again with your own customized template! ❑

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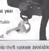

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APRIL

Independent Computer Consultants Association of British Columbia, Suite 720-999 W Broadway, Vancouver BC V5Z 1K5. DINNER MEETING. Tuesday April 29 1997. Guest speaker TBA. For more information & reservations call 734-2747 or Browse http://www.icca-bc.org/icca/events.htm

COMPUCHANGE COMPUTER SHOW. Sunday April 20th 1997 from 10am-4pm at the Firefighters Club, 6515 Bonsor Avenue, Burnaby. Table rental: 6ft for $29 or 8ft for $39. Private individuals can rent a portion of a table for $10, admission is $2; Children under 12 & under free. For inquiries phone Kimberley at 438-1084 or 438-5114 (evenings & weekends), day of the show phone 816-7731.

COMPUTER FEST 97 with Internet Forum from April 18-20 1997 at International Centre, 6900 Airport Road. Friday 10-9pm, Saturday & Sunday from 10-6pm. For more information: www.compfest.com, info line 416 324-0765, exhibit sales 416-925-4533 or contact the President David Carter, phone 416-925-4533, fax 416-925-7701, email dcarter@compfest.com

Thursday April 24 1997 8am-5pm. The Richmond Chamber of Commerce and the BC Institute for Studies in International Trade (BCSIT) in cooperation with the BC TIA are presenting a seminar on doing business in the USA. For further information contact the Richmond Chamber of Commerce at (604) 278-2822. TIA members pay $99.

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MULTIMEDIA 97 Exposition and Forum Conference: Tuesday May 6 - Friday May 9 1997 Trade Show: Wednesday May 7 - Friday May 9, 1997 at Metro Toronto Convention Centre 255 Front Street, West, Toronto, Ontario Canada (Just two blocks west of Union Station at the base of the CN Tower) For more information please contact: Jennifer Abramovic or Laura Ranieri at the Dutton Group (416)-756-7996

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Annual Awards Dinner on June 3rd 1997 at the Four Seasons Hotel. For more information Phone(604) 683-6158 Fax (604) 683-3879 email bctia@mindlink.bc.ca Web http://technet.org/bctia fax on demand (604)607-8622

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USER GROUPS

ATTENTION USER GROUPS: Send in your listing (maximum 120 characters) for the May issue by Friday, April 25 1997. Submissions run for one month only in the local edition. *The Computer Paper* reserves the right not to print submissions which are deemed unsuitable.

ACM/SIGGRAPH Computer Graphics. 2nd Tuesday at 620 Homer St. Call Tom Berryhill a 734 3876

ADAM OWNERS! Vancouver Island Senior ADAMophiles (Visa) newsletter meetings, supplies. Contact David Cobley #17 580 Seaview Rd. Qualicum Beach BC V9K 1N7 (604) 752-1684

ALT.2600 VANCOUVER USER GROUP Meetings are 1st Friday of each month at Pacific Center Mall by payphones in food court, north of Dunsmuir at Granville 4pm to 9pm. Starts early to catch the evening shift 2600ers. For more information contact Steve via email at <sogpo@vanbc.wimsey.com> or <sugenfra nbow.deocom.com>

AMIGA USER GROUP (PaNecAmA) For meeting times and place call Ray Herman 589-7198 or Robert Hardy 942-8364 BBS numbers 321-5982 or 231-0304

APPLES P.C COMPUTER SOCIETY A User Group for Macintosh and Apple IIs. Macintosh meetings are on 3rd Wednesday of each month at the York House School in Vancouver at 7 p.m. Novice and other special-interest groups are held mid month. Apple II meetings are on 1st Monday of each month at 7 p.m. at the Century House in New Westminster. For further information call 437-9406 or 299-9097

ATARI USERS! Vanteri P.O. and 3814 Main Post Office Vancouver BC V5B 3Y6 Bill Sutherland 604 1450 Don Hatch 433-8065 Street 2nd Wednesday 7:30 p.m. Hastings Comm Ctr 3096 E. Hastings

B.C. IBM USER GROUP For more information call 532-0294 (preferred), or voice mail 530-0818

B.C. INTERGRAPH USERS GROUP (BCIUG) Contact Mike Barnes 528-1936 (voice) or 526-2944 (fax) for info on next meeting.

B.C. OPENSTEP GROUP Regular monthly meetings focus on various themes, for single users, corporate users and developers in the Vancouver area. NextStep and OpenStep are the preferred platform for rapid development. For meeting information and email server call Kevin Hebert at 264-1984 or <khebert@wimsey.com>

B.C. REGIONAL USERS GROUP SOCIETY of Hewlett-Packard Users. For information call Darrin Salschuk at 661-8753 or BCRUG at 681-8848.

B.C. VAX/VMS Local Users Group (BCVAXLUG) provides a forum for the professional growth and education of its members through the exchange of solutions, ideas, and answers. User group meetings are held the 3rd Wednesday of every other month at 4:30 p.m. with location to be advised. For further info please call voice mail 278-8988

BIG BLUE AND COUSINS P.O. Box 5399 Station B, Victoria BC V8R 6S4. General meeting last Wednesday 7:30 p.m. at U Vic -Elliott Bldg Lecture Theatre 160. Also special interest group meetings 382 3804

CANADIAN INTERGRAPH USERS GROUP CONFERENCE September 8-11 1998 Delta Meadowvale Mississauga ON Theme "The Open Road" Contact Laura Banman Intergraph 2912 Memorial Dr SE Calgary AB T2A 7R9 Noon (403) 569-5562 Fax (403) 569-5801 e-mail ljbanman@ingr.com

CANADIANS ON COMPUSERVE Canadians around the world and anyone interested in things Canadian are joining the Canadian issues section of The Issues forum on Compuserve. Lively discussions center around politics, society, customs and conflicts. Plus, there's a growing library of Canadian files. Go Issues at any CompuServe prompt. Dial 1-800-848-8199 for more info

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COREL ARTISTS USER GROUP Last Tuesday of every month 7:00 to 10:00 pm at Kwantlen College in Richmond BC. Monthly newsletter. Contact: Bev Hanson, 533 5084

DATA LINK/USERS GROUP Tel 591-3387 PC support BBS 321-6873 (24 hr service) with specialized self-made BBS software. The purpose of this User group is to allow users to get together for problem solving, discussion of setup and to meet people. Call by voice 8 a.m.-4:30 p.m. ONLY please. This group is dedicated to RoboBOARD by Seth Hamilton. Other BBS software are welcome. Membership is free!

FONSOFT EDMONTON'S FOXPRO USERS GROUP-second Sunday 7:00 pm Grant MacEwan City Centre Campus East Wing Room C 137/C 135 10700-104th Ave. Contact: Ken Raymer at 437-9316 or Robin Stuart at 460-3712 (days) Info Bulletins on BBS 457-4106

GENERIC CADD USERS GROUP Contact: Frank Zander (604) 582-8183 BBS 294-0057 (9600 n,8,1)

HELP DESK INSTITUTE LOCAL CHAPTER An organization providing training, education and a networking forum for Help Desk Professionals. Those people who help computer users with hardware or software problems. For more information on memberships, please call Karen Yuen at 631-6098

INDEPENDENT COMPUTER CONSULTANTS ASSOCIATION OF BC The ICCA is a non-profit association of consultants who provide services in the field of Information Technology. The objectives of the ICCA are to provide a forum where consultants can network with each other, exchange skills and improve their business and computer skills. Monthly meetings with speakers. For further information contact us at: Suite 720-999 W.Broadway Vancouver BC V5Z 1K5 Tel (604) 734 2747 Fax (604) 734-2787 or E-Mail: icca@mindlink.bc.ca WWW http://www.icca.bc.org/icca/

LOTUS NOTES see "Pacific Notes User Group"

MACWEST COMPUTER SOCIETY Meetings for members and visitors include PD copy sessions. General meetings: 2nd Wednesday of each month. Beginner's meetings 3rd Wednesday of each month 7:30 p.m. Guildford Public Library, Surrey. Messages and information at 268-8930

MS ACCESS TECHNICAL USER'S GROUP For those who want to participate in learning more about MS Access. For information call Greg Hind at 454-0012 from 9:00 to 5:00.

NAMUGS (Northern Alberta Novell Users Group Society) meets quarterly at the CompuSmart store on Mayfield Road. For information please e-mail to namugs@freenet.edmonton.ab.ca or please Mike Breen (403)487-7986

OBJECTS USER SOCIETY See British Columbia OpenStep Group (B.C.O.G.)

OPENSTEP USER SOCIETY (VNUS) See British Columbia OpenStep Group (B.C.O.G.)

PACIFIC NOTES USER GROUP (PACNUG) Lotus Notes users meet the last Wednesday of each month 5:15pm at Rooms on Robson on July 31st. Contact Dolores Baker at 988-2141 or dolores Hillaworth may

PC/MAC USER GROUP Wanted Professional Photography/Graphic Designers to share network and learn the latest hardware and software programs available. Starting May 7th we will meet at 7:00pm every 1st and 3rd Tuesday of the month at Tricera Computer Center #203-1836 W 5th Ave. If you are interested please contact: B. Harrington or other 873-5015 or rasta@prismlink.bc.ca for further info

PORT COQUITLAM COMPUTER CLUB Commodore Amiga IBM-Mac 1st & 3rd Tuesday 7:30 p.m. Room 8 Minnekhada Middle School 1390 Laurier Ave. Port Coquitlam. Ed Dyn-Publicity at 942-6964.

POWER BUILDER User group being formed. Meetings are planned for first Wednesday. To enroll call Perform System Developers at voice mail 604 264-0047

SQL SERVER User group being formed. Meetings are planned for first Monday. To enroll call Perform System Developers at voice mail 604 264-0047

TI 99/4A COMPUTER B.C. 99er Users Group every Thursday 7:10 p.m. For information call Ron 522 2685 1st Thursday Tutorials 2nd Thursday General, 3rd Thursday Tutorials, 4th Thursday Library night. BBS "Dial A TI" 522-9830 TI only please

TEENS IN VANCOUVER USER GROUP For teens under the age of 18 interested in doing computer related projects regularly. WWW programming, games anything! The main goal is to share computer knowledge and to make friends. If there are any homeschoolers interested that would be great. If interested please call Orian Mak at 926-3836.

THE TOPKIDS CLUB A user group for kids, teens and parents. Monthly meetings are family focused with software/hardware demonstrations, guest speakers, Windows and Mac tips and online demonstrations. A BBS is available to members. Call Garland Coulson 270-5438 or email garland_coulson@topkids.com

VANCOUVER AUTOCAD USERS SOCIETY 1st Wed of the month 7:30 p.m. B.C.I.T. Bby Campus Bldg 3W5 Room 1850. Contact: Frank Zander (604) 582-8183.

VANCOUVER DELPHI DEVELOPERS ASSOCIATION meets once a month at the Vancouver Public Library (downtown). The meeting is usually on the 2nd or 3rd week of the month on Tue or Wed depending on availability of facilities. The purpose of the group is to provide a common and regular forum for Delphi developers to get together and discuss Delphi related issues. $10 admission to cover rental of room. All meeting notices are sent via fax or email. To add your name to our distribution list, send company name, address info, phone, fax and e-mail to Manuel U at 74367.720@compuserve.com or fax (604) 432 1796 or tel (604) 432-1700

VANCOUVER ENTERPRISE FORUM 438-8781

VANCOUVER FOXPRO USER GROUP (VFUG) September-June 3rd Tuesday at 1905 hours 200-1177 W Broadway. Info Doug at 736-2982, BBS 231-9709 and e-mail to jaylan@uniserve.com

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USER GROUPS

VANCOUVER GEOWORKS USERS CLUB. For further info. please call 683 7490 (eves)

VANCOUVER GEOGRAPHIC INFORMATION SYSTEMS USER GROUP Meetings are held on the 1st Wednesday of each month, September through May at B C I T Town Square Room C at 7 30pm. Contact Dwight at 940-1518 for information.

VANCOUVER KAYPRO USERS GROUP VANCOUVER PORTABLE COMPUTER CLUB (VPCC) AND 17 friendly members. Use free CP/M software, the latest DOS and Windows files, plus inexpensive access to the planet's Fidonet! Visitors welcome to our BBS. Contact person: Jay Siegel, 4251 Lancelot Dr, Richmond, B C V7C 4S4 271 1519 BBS 271 5934

VANCOUVER NETWARE USERS GROUP (VNUG) is an official user group recognized by the Netware Users International Assoc. and supported in part by Novell. Meetings are held on the first business Monday of every month at The Stanley Park Dining Pavilion. All aspects of the networking environment are discussed and presented with emphasis on the Netware network operating system. The workshop begins at 4:00p.m., buffet dinner at 6:00pm, at 7:00pm is a Q&A session followed by a presentation ending at around 8:30pm. Member, non-member and student pricing applies to the workshop and/or dinner presentation. For further information or meeting topic announcements call our voice mail at 689-VNUG (689-8684)

VANCOUVER OS/2 USER GROUP Attended by OS/2 gurus and novices alike and well supported by IBM. The large and lively meeting is held on the first Wednesday of each month at the BC Tel Building, 3777 Kingsway, Burnaby and starts at 6:45 pm. Join us for an informal workshop beginning at 11:30 am on the first and third Saturdays of each month at Dappler Computer Superstore, 485 W 8th Ave, Vancouver. Contact: Jim Snowchuk 876-4780.

VANCOUVER PC USERS SOCIETY (VPCUS) 2nd Thursday, 7pm at Science World. $5 guest admission. General Q&A session, feature presentation. Special Interest Groups (see also separate listings) and educational seminar registration. On-disk newsletter. Telephone 298-0988.

VANCOUVER SMALLTALK USERS GROUP (VSMUG) is a group of individuals and organizations interested in object-oriented analysis, design and programming with a particular emphasis on Smalltalk. Primarily for individual developers to meet, share ideas and experiences, discuss technical issues and learn cool stuff. It's designed not to be a forum for sales pitches from vendors. RSVP VSMUG@vcn.BC.CA or visit our web site at http://bcy.cac.uvic.ca/~bffb.

VANCOUVER WINDOWS NT USERS GROUP (VANTUG) is a forum for both developers and administrators interested in sharing their NT experience with their peers. Meetings are held every two months at the Justice Institute of BC (JIBC) in New Westminster. For more information contact Glen Houghton at ghoughton@jibc.org or at (604) 528-5581.

VISUAL BASIC PROGRAMMERS GRO Contact Johann at johannw@intergate.bc.ca

VISUAL OBJECT DEVELOPERS ASSOCIATION OF VANCOUVER. For information on our next meeting, contact John Kriewasser (604) 436-0218 fax: (604) 431-3946 CIS 72120,3156

VPCUS Clarion SIG — Clarion is a full-featured DOS & Windows application development platform. This current dark horse of software development tools will soon be acknowledged and acclaimed as a world class star, attracting market share and attention. Clarion uses a superior high level language that can be template driven and/or hand coded to produce stand-alone EXE files that are ROYALTY FREE. Check out the excitement. This lively SIG attracts a range of participants from seasoned professional programmers to new users and the curious. Meets second Tuesday of month at 7pm at Execu Train, Suite 1010, Cathedral Place, 925 West Georgia. Contact John Gelka, 736-7762

VPCUS DBUG (Data Base Users Group) Emphasis is on solving problems of data management with special reference to Paradox. Bring a blank 3.5 inch disk to pick up goodies from the meeting. Meetings for the next few months will be informal and held at a local pub. Contact Brad Emore 939-3888.

VPCUS Educational Seminars — Members $8, Non-members $15. Various topics, times and dates. Contact Gwenda Elwood, 737-8674

VPCUS HTML SIG Want to learn how to create a home page on the web? Do you want to share your expertise? HTML SIG meets the 2nd Tuesday of each month at 7pm at Execu Train, Suite 1010, Cathedral Place, 925 West Georgia. contact laney@unixg.ubc.ca or virginia@arts.ubc.ca"

VPCUS Internet SIG Meets last Wednesday of month, 7pm at 1129 Main Street. Contact: Bob Turner at bturner@sfred.ca for more details"

VPCUS LINUX SIG-Meets 3rd Monday of each month at 7:00pm at Execu Train, Suite 1010, Cathedral Place, 925 West Georgia. For further information please call Stan Claussen 532-6846 or email to claussen@direct.ca"

VPCUS Novell Network SIG. This is the place for you if you are a network administrator with Novell glory stories and tips to share, or if you just want to get together with actual Novell users to explore its ins-and-outs. Contact Brendan kdelaney@unixg.ubc.ca"

VPCUS MICROSOFT OFFICE SIG. The place to come if you are a user of any of the Microsoft office Pro products and want to learn more and share your tips. Meetings are temporarily canceled; for more details call Chris Mullen at 325-8509 who is reorganizing.

VPCUS Windows/C++. For programmers and intermediate-to-expert Windows users who are interested in C, Access, Visual Basic. Meets second Tuesday of month at 7pm at Execu Train, Suite 1010 Cathedral Place, 925 West Georgia. Contact Casey Hawthorne 879-2703 or at caseyh@istar.ca"

VPCUS WordPerfect SIG. Participants share tips and tricks of this wonderful office product. Meetings are on hiatus at this time. Contact Holly for more Details at 731-0039 or email to hollyr@deweco.com"

WINDOWS NT User group being formed. Meetings are planned for first Saturday. To enroll call Perfect System Developers at voice mail 604-264-0247

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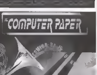
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Intel's Grove redefines the PC, Compaq ships 30 millionth

BY DAVID TANAKA

HOUSTON—At Compaq's [illegible] technology conference, Intel [illegible] executive officer Andrew Grove said a [illegible] discontinuity was about to occur in the evolution of the business PC. [illegible] keynote address Grove said [illegible] computing [illegible] the [illegible] Compaq [illegible] [illegible] 486 [illegible]

Grove said [illegible] performance [illegible] longer be measured [illegible] speed [illegible] Historical performance used [illegible] as a one dimensional [illegible] "It is now necessary to use three different vectors to describe performance: Integer performance, floating point performance and multimedia performance."

To improve floating point performance, Intel announced the Dual Independent Bus architecture, which connects Level 2 (L2) cache directly to the Pentium II processor (announced for May) through a cache bus. The Pentium processor, L2 cache and cache bus will be packaged in a new format called [illegible]

[illegible] MMX [illegible] definition of computing performance.

> **"It is now necessary to use three different vectors to describe performance: Integer performance, floating point performance and multimedia performance"**
>
> *—Andy Grove*
>
> **CEO, Intel**

Compaq ships 30 millionth PC

Intel's announcements were the highlight of the three day biennial event sponsored by Houston based Compaq. The event drew approximately 6,000 participants, mainly Compaq resellers and business partners.

In an opening address, Compaq president and CEO Eckhard Pfeiffer announced that Compaq had shipped its 30 millionth PC in April and that it also had shipped more than one million servers.

Compaq is now the fifth biggest PC maker in the world, and Pfeiffer said the company's goal is to [illegible] the third biggest by the year 2000.

Compaq also [illegible] a new model of product delivery to corporate customers, where it will build products to order [illegible] products to order.

The new model of product delivery is scheduled for implementation beginning in May, initially in the U.S. and Australia.

Compaq also announced the Armada 1500, a "value line" notebook that will be selling in Canada for approximately $3,000. All models will have an integrated 10X CD drive and 16 MB of RAM.

Processor choices include 120 MHz and 133 MHz Pentiums.

In conjunction with Integrated Computing Engines, Compaq was also demonstrating its Compaq Accelerator Server, a proxy Web server that the company says will now load Web pages three to four times faster. ❑

Que sera, sera

What Will Be filled with optimistic predictions

BY JEFF EVANS

What Will Be: How The New World Of Information Will Change Our Lives
Author: Michael Dertouzos [illegible] Bill Gates
Publisher: HarperEdge (a Harper Collins imprint)
Hardcover: 336 pages
ISBN 0 06 251479 2
Price: $35

There are a lot of books hyping the changes that computer and networking technology will make to our lives that tend to be fairly similar rehashes of a limited number of concepts: hackers, viruses, virtual reality, cybersex, and so on.

This book by Michael Dertouzos, the man who has headed up the Massachusetts Institute of Technology's (MIT's) Laboratory for Computer Science for more than 20 years, is a notch above the usual exercises in high tech forecasting, since Dertouzos has been intimately connected to the creation of the technological trends he is trying to project into the future.

Dertouzos's understanding of technological change is both wide and deep. As a boy in Greece, he was captivated by an American article on a mechanical, maze navigating mouse, and he got himself to MIT so that he could be part of the explorations that he found so magical. He happened to land in the right place at the right time to take part in the great flowering of computer science in the 1960s, which laid the groundwork for the Internet and the personal computer.

He has one great concept of how people can benefit from computers and telecommunications, derived from his Greek [illegible] model for the ideal of the [illegible] the Athens flea market, a seemingly chaotic but rich marketplace that allows unlimited opportunities for discovery, discussion and trade.

In his early days at MIT, he [illegible] transformation of computing from [illegible] technical, narrow technology to the beginnings of a social medium, where early [illegible] networking [illegible] computer users could [illegible] choose to communicate directly with other people across the network, not only for [illegible] work related purposes but also for play and self-directed learning, and any other common interest that stimulated them. The ability to use computers for social and intellectual interaction was a key element in developing the computer culture that led to the PC.

Although Dertouzos bemoans the inability of early PCs to easily and naturally connect [illegible] that in the [illegible] the World Wide Web PC users [illegible] content [illegible] the [illegible] benefits of [illegible] computing [illegible] the [illegible] [illegible] computing [illegible] [illegible]

[illegible] the [illegible] [illegible] computing.

He suggests that the computer technology of the next decade may [illegible] globalized mass culture [illegible] over much of humanity [illegible] really wipe out local cultures. He points to the examples of Chinese and Greek civilizations that have endured widespread dispersal and foreign conquest [illegible]

Dertouzos [illegible] [illegible]

In short, What Will Be [illegible] authoritarian [illegible] handful of intellectual nuggets to help us understand where all this computer stuff has come from, where it will go, and where we humans fit in the process. ❑

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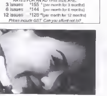

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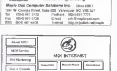

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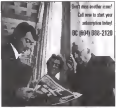
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